COACH PRESSURE AND DISORDERED EATING IN FEMALE COLLEGIATE ATHLETES: IS THE COACH-ATHLETE RELATIONSHIP A MEDIATING VARIABLE?

by

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A thesis submitted to the faculty of
The University of Utah
in partial fulfillment of the requirements for the degree of

Master of Science

Department of Exercise and Sport Science

The University of Utah

August 2011

The University of Utah Graduate School

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ABSTRACT

When athletes "uncritically accept" the demands of their sport and the tenants of the sport ethic, negative health consequences are all but inevitable. Whether it be poor injury management, the abuse of performance enhancing substances, or unhealthy eating habits, the "uncritical acceptance" of sport norms can lead to overconformity to the sport ethic. Researchers have theorized that antecedents, such as overconformity, affect athletes' communication with their coaches, which then affects the coach-athlete partnership and thus various health consequences including disordered eating behaviors. The influence of the coach on disordered eating behaviors may be a product of factors related to overconformity to the sport ethic, subsequent issues with coach communication regarding recommendations for weight management, and the strength of the coach-athlete relationship. Few published studies to date have explored the nature of the relationship between athletes' perceptions of coach pressure and disordered eating patterns and no published studies to date have examined the role of the coach-athlete partnership on this relationship. The present study included female varsity athletes and dancers from four universities. Participants completed a questionnaire packet to measure weight-related coach pressure, the coach-athlete partnership, and disordered eating behaviors. Of the 248 participants, 13.30% exhibited disordered eating behaviors. An additional 2.0% reported being diagnosed in the past; however, the 25% of athletes who reported having a

teammate with an eating disorder may indicate that underreporting was an issue with this study. Perceived weight-related coach pressure and coach-athlete partnerships explained approximately 13% of the variance of disordered eating behaviors in this sample, but predictability was moderated by sport type. Mediational analysis revealed that the coach-athlete partnership was a partial mediating variable; nevertheless, limitations in the data warrant future research. Understanding the contribution of coaches to disordered eating behaviors is important as they can lead to clinical eating disorders and a wide array of short-term and long-term health consequences. Subsequently, strong relationships between coaches and their athletes may reduce the negative impact of perceived weight-related coach pressure on the development or exacerbation of disordered eating behaviors in female collegiate athletes. Identifying this mechanism may provide practitioners with an effective point of intervention.

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ACKNOWLEDGMENTS

I would like to thank my colleagues and friends who helped me on this journey, without whom I would not have been able to finish my work. I thank Dr. Barry Shultz for his insistence on clear, consistent communication and his expertise in statistics; he helped me become accustomed to red ink and brought out the best in my writing. I thank Dr. Justine Reel whose expertise in the field helped me to expand my ideas of study in the area of eating disorders and helped me to pinpoint what I really hoped to study. Dr. Melinda Houston put out all of my small fires and challenged my curiosity about coach-athlete partnerships and sport psychology in general, both of which have set me on my career path. And I appreciate Dr. Maria Newton, who read draft after draft, always stimulating my thoughts, helping me to always go a step further than I believed I could. And all of this, without the help and support of my research team, my friends, would be for nothing. Thank you Dr. Nick Galli, Bergen Beck, Christina Heilman, Stephen Gonzalez, Ashley Crawford, Andrea Stark, and Sumer Addy.

As a final thank you, I thank my husband for putting up with the long nights, the endless revisions, and my near panic attacks. Without his support and understanding, I am sure I would have fizzled out long before this thesis was finished.

CHAPTER 1

INTRODUCTION

In addition to the 2-12% of female collegiate athletes who suffer from clinical eating disorders (Cogan, 2004; Greenleaf, Petrie, Carter, & Reel, 2009), disordered eating behaviors plague 1-64% of female collegiate athletes in America (Beals, 2004). The media has made some mention of Kathy Johnson, a gymnast who developed anorexia after being criticized about her weight by her coach; Heidi Guenther, the ballerina who died at 22 from the eating disorder she developed, following instruction from her company to lose five pounds in order to earn the principal role; and Christy Heinrich, the gymnast, rumored to have developed anorexia that eventually killed her at 47 pounds after hearing from a competition judge that she was too fat to excel (Casa Palmera, 2007).

Although headlines are laden with prominent athletes suffering with clinical eating disorders, athletes at lower competitive levels in sport still suffer from the same disordered eating behaviors and, due to limitations in research methods, likely exhibit these behaviors at higher levels than we know. Therefore, the question remains, how many other nonelite athletes have experienced pressure to lose weight for their sport or suffered from an eating disorder in silence? To answer this question, researchers need to better understand the mechanisms behind the development or exacerbation of such behaviors to develop truly effective prevention programs.

In order to begin to understand the mechanisms behind the development or exacerbation of eating disorders and disordered eating behaviors, we must first understand the problem. This study is framed within the sociological construct of positive deviance, or overconformity to the sport ethic. That is, positive deviance is a product of overconformity to the sport ethic. According to the sport ethic, athletes should: (a) sacrifice for The Game, (b) strive for distinction, (c) accept risks and play through pain, and (d) refuse to accept limits in the pursuit of possibilities (Coakley, 2009; Hughes & Coakley, 1991). This type of deviance involves "uncritical acceptance" of and adherence to sport norms, as opposed to the rejection of such norms as seen in negative deviance or underconformity (Coakley, 2009, p. 155). The construct of overconformity was used for this study as disordered eating behaviors have been cited as manifestations of overconformity to the sport ethic in previous research (Atkinson & Young, 2008; Coakley, 2009; Hughes & Coakley, 1991).

An important distinction here is the difference between eating disorders and disordered eating behaviors: all eating disorders require disordered eating behaviors, but individuals exhibiting disordered eating behaviors do not necessarily meet diagnostic criteria for a clinical eating disorder (Thompson & Sherman, 2010). One obvious problem in the field of eating disorders and disordered eating behaviors is the large range of reported prevalence rates—2-12% and 1-64%, respectively. This variability can be explained in part by issues with self-report instruments with greater degrees of sensitivity and the samples selected (Beals, 2004; Greenleaf et al., 2009; Thompson & Sherman,

2010). Therefore, more research to explore the nature of eating disorders and disordered eating behaviors and contributing factors is necessary.

Many factors contribute to the development of eating disorders including the following: pressure from teammates, coaches, parents, and judges; personality factors; gender, ethnicity, and sport type; performance anxiety; media; and revealing uniforms (Engel et al., 2003; Kerr, Berman, & de Souza, 2006; Reel & Gill, 1996; Thompson & Sherman, 1999b, 2010; Williamson et al., 1995). Unfortunately, research on these predictors, or risk factors, has yielded mixed results. For instance, Reel, Soohoo, Petrie, and Greenleaf (2010) found that weight pressures from coaches/team/sport accounted for 37.4% of the variance in disordered eating behaviors, illustrating a direct effect of social pressure on disordered eating behaviors. On the other hand, Williamson et al. (1995) found that social influence (e.g., pressure from teammates and coaches), performance anxiety, and athlete self-appraisal predicted eating disorder symptoms through the mediating effect of body concern. As a result of this and other conflicting evidence, and in accordance with other researchers calling for a focus on the risk factors of eating disorders (Petrie, Greenleaf, Reel, & Carter, 2009), future research should strive to better understand the nature of the relationship between antecedent variables, such as perceived coach pressure, and athletes' disordered eating behaviors.

In a study investigating contributing factors to disordered eating behaviors, five were identified that related directly to coaches. Eighty-four female athletes who had a clinical eating disorder identified the following factors as contributing to their disorders: (a) athletic personnel made a remark regarding a need for weight loss; (b) the athlete was

required to weigh-in in front of an audience; (c) each of the team members' weight was made public knowledge; (d) the athletes felt required to lose weight or reduce percent body fat to fit the coach's ideal; and, (e) the athlete feared losing her position or team membership if she did not lose weight (Guthrie, 1991). Muscat and Long (2008) found that athletes who recalled critical comments from coaches who focused on weight loss were significantly more likely to develop disordered eating behaviors than those athletes who could not recall weight-related coaching comments. Likewise, athletes who heard weight concerns from others were 2.8 times more likely to develop subclinical eating disorders (Williams et al., 2003).

In a study on coach pressure and disordered eating behaviors in female high school and college athletes, Reel and Gill (1996) found almost 70% of respondents believed that weight and body image were important to their coaches; 17.8% of the respondents' coaches openly encouraged weight loss behavior. Eating disorders can be life-threatening and, given their amount of contact with athletes, coaches may serve to prevent or exacerbate these disorders (Thompson & Sherman, 2010; Turk, Prentice, Chappell, & Shields, 1999). As Berry and Howe (2000) recommended, future research should focus on the role of the coach in the development of eating disorders as there is "evidence that a coach may play a significant role in these behaviors" (p. 216) that "pose a significant threat to the health and well-being of far too many athletes" (Beals, 2004, p. 39).

What this tells us is that athletes who hear comments from their coaches, as well as perceive that the coach's ideal is to be leaner, thus requiring weight loss, are more

likely to develop disordered eating behaviors than athletes who do not hear those comments or perceive such an ideal. It is important to study both direct and indirect pressure, from the athletes' perspective, for a number of reasons, including the fact that perceptions can be equally as devastating on weight loss behaviors as direct comments (Dosil & Gonzalez-Oya, 2008). As a result, the term "perceived coach pressure" is used to encompass both athletes who hear direct comments about the necessity of weight loss and those who develop perceptions about what the coach wants in terms of weight loss from more indirect sources. For the current study, only athletes' perceptions of coach pressure were investigated as past research has illustrated that there is often a large discrepancy between athletes' perceptions of coach behavior and coaches' perceptions of coach behavior (Anshel & Straub, 1991). Additional support is provided by the finding that it is the athletes' perceptions of that pressure that can ultimately lead to disordered eating behaviors (Dosil & Gonzalez-Oya, 2008).

In an attempt to understand the nature of the relationship between perceived coach pressure and disordered eating, the current study is based upon an adaptation of the Integrated Research Model of coach-athlete relationships (Jowett & Poczwardowski, 2007). According to this model, an antecedent variable, such as the sport ethic, facilitates certain communication patterns—in this case, perceived coach pressure to lose weight or maintain a low body weight—which then affects the coach-athlete partnership. In turn, the quality of the coach-athlete partnership affects outcome variables, such as disordered eating in athletes (Jowett & Poczwardowski, 2007). The primary emphasis of the current study is the relationship between perceived coach pressure to lose weight or maintain a

low body weight and disordered eating behaviors, and if that pressure is mediated by the quality of the coach-athlete partnership; therefore, this specific application is offered in Figure 1.1.

Based on this model, it is possible that perceived coach pressure, as demonstrated by the communication domain, affects athletes' perceptions of their feelings, thoughts, and behaviors toward and from their coaches. That is, all aspects of the coach-athlete partnership—including the following: (a) closeness, or the athlete's feelings of understanding and connectedness to their coach; (b) commitment, or her intentions to continue her working relationship with her coach; and (c) complementarity, her

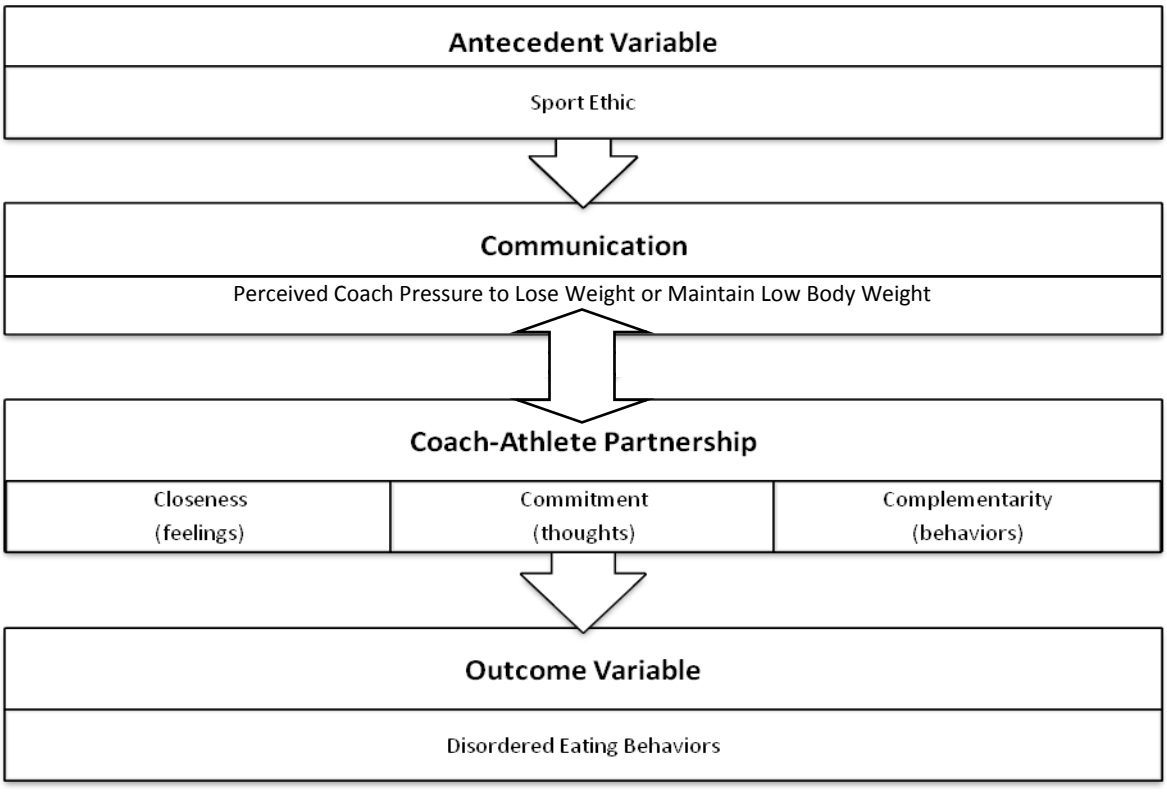


Figure 1.1. An integrated research model of coach-athlete relationships; adapted from Jowett & Poczwardowski (2007).

interactions with her coach to pursue mutual goals—affect and are affected by communication between the athlete and the coach. Thus, if this communication is perceived as negative, then the perceived pressure will affect the quality of the partnership and the quality of the partnership will affect the athlete's perceptions of pressure. The quality of the coach-athlete partnership then affects outcome variables, including the athlete's health (Jowett & Poczwardowski, 2007). Therefore, if perceived pressure is present and is perceived to be related to weight concerns, it may have an impact on the coach-athlete partnership, which will then impact future interpretations of pressure that may influence the emergence or amplification of disordered eating behaviors.

If this is the case, it could be that athletes' perceptions of coach pressure are mediated by the coach-athlete partnership such that individuals who feel less close to their coaches perceive more pressure than athletes who feel more close to their coaches. They may perceive less pressure to lose weight or maintain a low body weight because they better understand the verbal and nonverbal, direct and indirect communication from their coaches. On the other hand, it might be that closeness magnifies perceived coach pressure to lose weight or maintain low body weight as the athletes' feelings of closeness may make them more vulnerable to the perceived ideals of the coach. Additionally, athletes who are highly committed to their coaches and comply with the coach's recommendations to improve performance—a case reflected by higher levels of either the commitment and/or complementarity constructs of the coach-athlete partnership—may perceive more coach-pressure to lose weight or maintain low body weight than

individuals who do not take such communication as seriously. Theoretically, this may be due to the uncritical acceptance of the sport ethic exhibited by positively deviant athletes.

Researchers in the field of relationships have recognized that our relationships with others and our self-concept are closely linked and that studying the impact of one on the other may prove valuable in better understanding both (Jowett & Cramer, 2010). To date, little research has been done on the role of the coach-athlete partnership in regard to its effect on outcome variables. What research that has been done includes how the strength of the partnership affects social support within the relationship, depth of the relationship, and conflict within the relationship (Jowett, 2009). Results of Jowett's (2009) study indicated that stronger overall coach-athlete relationships were positively correlated with social support and depth of relationship, whereas weaker relationships were associated with more conflict than stronger relationships. Additional outcome variables recommended for future research included coach and athlete health issues such as eating disorders (Jowett & Poczwardowski, 2007).

Because the coach-athlete partnership has yet to be linked to disordered eating behaviors, similar relationships, such as the parent-child relationship (social influence), must be used to infer the possible role of the coach-athlete partnership on perceived coach pressure and disordered eating behaviors. In these relationships, parental comments have been linked to disordered eating behaviors, illustrating the need for research on coach-athlete partnerships that may include similar comments and perceived pressure to lose weight or maintain low body weight. For example, researchers found that comments from parents regarding weight gain have been shown to influence

individuals by making them more likely to compare themselves to others and internalize such comments, as well as increasing their body dissatisfaction, which then leads to a drive for thinness and eating disorders (Rodgers, Paxton, & Chabrol, 2009). These comments account for 40% of the variance explained for body dissatisfaction, which then accounts for 45% and 42% of the drive for thinness (a component of anorexia) and bulimia, respectively.

It has also been reported that negative comments were associated with lower perceived familial support (Taylor et al., 2006). If coach-athlete partnerships follow similar trends, and lack of support is associated with weaker coach-athlete partnerships (Jowett, 2009), it stands to reason that weaker coach-athlete partnerships with individuals who perceive more negative comments, or coach pressure to lose weight or maintain a low body weight, may experience greater body dissatisfaction as a result of those comments, which can then lead to disordered eating behaviors.

Additionally, parent-child relationships have been linked to disordered eating behaviors through conflict and lack of intimacy. These results may be similar to findings in coach-athlete partnership research that indicated stronger relationships have more social support and depth of relationship—which may indicate the presence of intimacy or closeness—and weaker partnerships harbor perceptions of conflict (Jowett, 2009). Therefore, although possible disordered eating behavioral outcomes of the coach-athlete partnership have not been studied, they may be similar to disordered eating behavioral outcomes found in parent-child relationships in which conflict is present and intimacy is lacking. More specifically, conflict in the parent-child relationship has been shown to be

a predictor of weight concerns among adolescents (May, Kim, McHale, & Crouter, 2006) such that conflict with both the mother and the father, or each individually, resulted in higher weight concerns among adolescent females. Moreover, decreases in intimacy with either the mother or the father correlated with higher weight concerns among individuals in the sample (May et al., 2006). Another study found that individuals with clinical eating disorders experienced more conflict and less intimacy in their relationships with their parents and perceived their overall relationship with their parents as "less favorable" than parent-child relationships in the control group (Latzer, Lavee, & Gal, 2009, p.1213).

Taken together, these findings indicate that perceived coach pressure may have a similar impact on an athlete's disordered eating behaviors as do negative comments from parents on the presence of disordered eating behaviors in children. Additionally, lack of social support and depth of relationship, as well as the presence of conflict—all characteristics of weaker coach-athlete partnerships—may have similar effects on disordered eating behaviors as conflict and lack of intimacy, present in the parent-child relationship, have on children with severe weight concerns and disordered eating behaviors.

Given the finding that stronger coach-athlete partnerships are associated with social support and depth of relationship and that weaker partnerships are associated with greater conflict (Jowett, 2009), and that conflict and lack of intimacy have been shown to have an effect on individuals in similar relationships (Latzer et al., 2009; May et al., 2006), it is important to understand the role of the coach-athlete partnership in weight concerns and disordered eating behavior. It is possible that the lack of intimacy and

depth of relationship may relate to the closeness dimension of the coach-athlete partnership, whereas social support and conflict relate to either the commitment or complementarity dimensions of the coach-athlete partnership.

Previous research has indicated that close relationships are necessary to promote optimal psychological development and well-being; conversely, relationships lacking in closeness can lead to emotional problems as well as maladaptive and destructive behaviors (LaVoi, 2007). Therefore, it could be that athletes who do not experience close relationships with their coaches may be at more risk of developing psychological problems like disordered eating. This may be the case particularly at the collegiate level at which physical distance impedes the ability of athletes to substitute close family relationships for poor coach-athlete partnerships—which may be more common at the youth level. This connection, if it exists, has yet to be researched in the sport context; therefore, this study sought to investigate it further.

Research on the role of commitment, as well as the role of complementarity, in the development of disordered eating behaviors is nonexistent. As some case studies have found that athletes have developed disordered eating behaviors in an effort to please their coaches (Jones, Glintmeyer, & McKenzie, 2005; Krane, Greenleaf, & Snow, 1997), it could be that heightened commitment to and/or complementarity with the coach is likely to increase athletes' risk of disordered eating behaviors as they see their coaches as ultimately knowledgeable in the pursuit of excellence (Poczwardowski, Barott, & Henschen, 2002).

Research to address these unanswered questions in the area of the coach-athlete partnership is imperative, as understanding the nature of the relationship between perceived weight-related coach pressure and disordered eating behaviors, and if that relationship is mediated by the coach-athlete partnership, may provide a platform for future researchers to develop more effective prevention and education programs. Though we must concede that coaches are not the sole cause of disordered eating habits—athletes become "ill due to [their] own problematic characteristics which [can result] in an ill-considered response to a sensitive, although not uncommon, comment" (Jones et al., 2005, p. 385)—we cannot deny the influence of the coach on athletes' decisions. For this reason, studies should investigate the possible impact of the coach-athlete partnership on these behaviors.

In conclusion, when athletes perceive pressure from their coaches to lose weight or maintain a low body weight, whether that pressure is direct or indirect, they can develop disordered eating behaviors that may escalate into subclinical or clinical eating disorders. If researchers can explain to what extent athletes perceive pressure from coaches to lose weight, and if that pressure is mediated by the coach-athlete partnership, practitioners can hopefully learn to better manage perceived coach pressure as a possible risk factor for disordered eating behavior.

Purpose

The purpose of this study was to investigate the coach's role in athlete's weight-control strategies in order to understand the influence of the coach on the development of disordered eating patterns. Current research found that coach pressure was reported by as

many as 33.7% of athletes surveyed about weight-related pressures in their sport (Reel et al., 2010) and other studies have claimed that the coach is a contributing factor in the development of disordered eating patterns (de Bruin, Bakker, & Oudejans, 2009; de Bruin, Oudejans & Bakker, 2007; Ransdell & Petuchroff, 2007). However, a quantifiable relationship between athletes' perceptions of that pressure and disordered eating behaviors has not yet been established.

Likewise, researchers (e.g., LaVoi, 2007) in the area of the coach-athlete partnership have identified the need for similar research, stating that little research has examined the interpersonal characteristics inherent in the partnership and how those characteristics affect psychosocial outcomes. Disordered eating is a psychological issue, influenced by social factors; thus, based on LaVoi's recommendation, researchers should seek to understand if the coach-athlete partnership has an effect on disordered eating patterns in athletes.

The purpose of this study to better understand the nature of the relationship between perceived coach pressure to lose weight or maintain a low body weight and the manifestation of disordered eating behaviors, exploring the coach-athlete partnership as a possible mediating factor. First, given the extant research that identifies coaches as a risk factor in the absence of empirical evidence of the relationship between perceived coach pressure and disordered eating behaviors (Berry & Howe, 2000; de Bruin et al., 2007; de Bruin et al., 2009; Kerr et al., 2006; Thompson & Sherman, 2010; Zahensky, 2009), this study sought to identify what relationship exists between perceived pressure from coaches to lose weight or maintain a low body weight and disordered eating behaviors in

athletes. Although a cross-sectional design does not lend itself to produce causal relationships, it has been determined that for activities that can be detrimental to the participant, precautionary measures should be taken at the expense of truly experimental support (Thompson & Sherman, 2010).

Second, Stice (2002) recommended that future research explore how psychosocial factors work together to impact disordered eating in athletes. To accomplish this and further understand the nature of the relationship between perceived coach pressure and disordered eating behaviors, this study sought to determine if that relationship, between perceived coach pressure and disordered eating behaviors, is mediated by the coach-athlete partnership.

The following research questions were addressed:

1. Is there a relationship between female collegiate athletes' perceptions of coach pressure and disordered eating behaviors?
2. Does the coach-athlete partnership mediate the relationship between perceived coach pressure and the development of disordered eating behaviors in collegiate female athletes?

Hypotheses

The proposed hypothesis of this study was that athletes who report perceived pressure from coaches to lose weight will exhibit more disordered eating behaviors than athletes who report less perceived pressure from coaches to lose weight or maintain a low body weight.

A secondary hypothesis to address how the strength of the coach-athlete partnership affects the relationship between perceived coach pressure and disordered eating behaviors was not offered due to conflicting research and the exploratory nature of the study. Recently, Jowett (2009) hypothesized that stronger coach-athlete partnerships, and thus greater interdependence between the coach and the athlete, would result in positive outcomes (e.g., social support, depth of the relationship). She also hypothesized that these elevated scores would correlate negatively with negative outcomes, such as conflict. The results of her study supported these hypotheses with positive correlations, ranging from r = 0.42-0.63. According to her research, it is possible that the social support an athlete feels from her coach, combined with the depth of the relationship, mediates the pressure she feels from her coach to lose weight. However, case studies on athletes with eating disorders reflect that some athletes with disordered eating behaviors develop them as a result of their desire to please their coach (Jones et al., 2005; Krane et al., 1997) a phenomenon that may relate to the Commitment and Complementarity constructs of the coach-athlete partnership. Additionally, it is possible that the coach-athlete partnership may not be a mediating factor between perceived coach pressure and disordered eating behaviors in athletes; rather, it could be independent of coach pressure or have no effect at all on the relationship.

Limitations

Underreporting in the field of eating disorders and disordered eating behaviors is a common problem; some athletes do not wish to admit that they have a problem, others worry that they might lose their position on the squad or will be looked down on by

coaches and teammates for admitting they have a problem, and still others may not see excessive exercise or significant calorie restriction as a problem, instead viewing it as a product of the environment and path to success (Beals, 2004; Greenleaf et al., 2009; Reel & Gill, 1996). This self-report bias was a major concern because, as Hausenblas and Carron (1999) pointed out in their meta-analysis, response-style bias, inaccurate reporting, defensiveness, and denial may be more likely to occur with self-report instruments than more objective methods of data collection.

Additionally, the use of a true experimental design on this type of research has been deemed inappropriate (Thompson & Sherman, 2010); therefore, a self-report measurement was used to preserve the integrity and safety of the participants. In an effort to combat the self-report bias, athletes were informed that their results would not and could not be revealed to their coaches or support staff; lie scales and measures of social desirability, such as the Marlowe-Crown Social Desirability Scale (1960) were not used as they were deemed likely to cause response fatigue. They were reassured that there was no way to identify their results.

Moreover, because this study was nonexperimental, it was not possible to control for contributing and confounding variables. A single item on both the contagion effect and goal orientation was included in the questionnaire packet to get a sense of the presence or absence and type, but it was by no means extensive enough to control for such possible confounders. As a result, possible confounding effects on perceived coach pressure, the coach-athlete partnership, and/or disordered eating behaviors could not be quantified.

In addition, because participation in this study was voluntary, there was a possibility that individuals who exhibit disordered eating behaviors may have chosen not to participate in the study, which might have biased results. Finally, generalizability of the results was also limited due to geographic constraints of the study and the use of convenience sampling to obtain participants.

Delimitations

The following delimitations were applied to the study:

1. All participation was voluntary.
2. All participants must be female.
3. Participants must be at least 18 years of age.
4. Participants must be a member of a university athletic team or be a member of a cheerleading/dance squad.

Assumptions

The following were assumptions for this study:

1. Participants adequately reflect the normal female collegiate athlete population.
2. Participants answered questions honestly.
3. My presence during the survey completion process did not influence the athletes.

CHAPTER 2

LITERATURE REVIEW

Disordered eating behaviors and eating disorders are a complex problem for any population. They are influenced by a multitude of factors, including individual and social factors (Thompson & Sherman, 2010), but such issues may be even more complex for the athletic population who encounter additional influences and challenges. Although there is a litany of research investigating the many facets of eating disorders (e.g., Beals, 2004; Greenleaf et al., 2009; Kerr et al., 2006; Thompson & Sherman, 2010), there is a dearth of research on claims about the role the coach plays in the development or exacerbation of eating disorders.

At present, many studies have focused on the prevalence of eating disorders in the athletic population (e.g., Greenleaf et al., 2009; Guthrie, 1991; Williams et al., 2003), risk and maintenance factors for athletes (e.g., Stice, 2002; Thompson & Sherman, 1999), and other psychosocial correlates of eating disorders in athletes (e.g., Doughty & Hausenblas, 2005; Hinton & Kubas, 2005; Petrie et al., 2009). However, research on the influence of coaches' opinions on athletes' disordered eating behaviors remains limited (e.g., Kerr et al., 2006; Muscat & Long, 2008). Moreover, researchers in the field of weight pressures in sport have been moving toward understanding the pressures in the sport world that are associated with disordered eating behaviors (Reel et al., 2010), but they lack the ability to

explain the nature of the relationship between those perceived pressures and disordered eating behaviors. As a result, it has become necessary to understand the nature of the relationship between the athlete's perceptions of weight-related coach pressure and disordered eating behaviors, as well as the role the coach-athlete partnership may or may not play in this relationship.

Theoretical Framework

To truly understand the nature of disordered eating behaviors in athletes, it is important to understand the context within which these behaviors occur. This study is nested within the sociological construct of positive deviance; that is, positive deviance is defined as overconformity to the sport ethic. The sport ethic has commonly accepted norms of sacrificing for the game, striving for distinction, accepting risks and playing through pain, and refusing to accept limits in the pursuit of possibility (Coakley, 2009; Hughes & Coakley, 1991). Deviance has been conceptualized on a bell curve, with normal, widely accepted sport behavior encompassing the majority of the bell curve, while negative deviance and positive deviance occupy either end of the curve (Atkinson & Young, 2008; Coakley, 2009). On the negative end of the bell curve, underconforming athletes openly reject the norms of the culture, participating in often criminal behaviors (e.g., fighting, illicit drug use). On the positive end, athletes overconform to the ethic, doing what is necessary to satisfy the sport norms, but taking those actions to an extreme (e.g., playing while concussed, taking performance-enhancing substances; Coakley, 2009).

Converse to previous models of deviance as a rejection of social norms, overconformity is the "uncritical acceptance" of those norms in an effort to confirm or reconfirm the identity of "athlete" (Hughes & Coakley, 1991, p. 308). According to sociologists of sport, athletes willfully overconform to the sport ethic for a number of reasons, including the following: (a) coaches' tendencies to praise other overconforming athletes, using them as models for appropriate behavior; (b) the belief that overconformity is the mark of a true athlete, which then grants access to peer approval and acceptance; (c) the desire to stay in the action; (d) exceeding limits produces drama, which bonds teammates together through a "bunker mentality"; and (e) the belief that overconformity to the sport ethic will result in an increased likelihood of being chosen for continued participation in sport (Atkinson & Young, 2008; Coakley, 2009; Hughes & Coakley, 1991).

Athletes learn to accept the sport ethic as important people in their lives reinforce its value (Hughes & Coakley, 1991). For instance, coaches encourage overconformity "intentionally or naively" by praising overconforming athletes and using them as models of the ideal athlete. They also often condemn other athletes who are not measuring up as lazy or noncommitted (Coakley, 2009, p. 311). Athletes then respond to this encouragement by sacrificing their bodies in their quest to gain approval as "athletes" from their coaches. These athletes believe that pleasing the coach will result in the approval from that coach and that this approval will solidify their identity as "athlete." Given that the concept of positive deviance is influenced by "uncritical acceptance of and commitment to" what athletes have been told by "important people in their lives"

(Hughes & Coakley, p. 308), and coaches are often considered to be important in the lives of athletes, perceived coach pressure was chosen as the first influencing factor of the study.

Individuals invested in the sport ethic to the point of overconformity rarely consider the long-term consequences of their actions (e.g., relationship trouble, chronic pain/disability; Coakley, 2009). This is likely due to the internalization of the sport ethic such that the individual evaluates herself on the basis of her ability to exceed coach and teammate expectations (Coakley, 2009; Hughes & Coakley, 1991). Once this has occurred, overconformity becomes the standard and the behavior is no longer seen as deviant, making research efforts in this field difficult.

One of the greatest concerns in studying deviance in sport is the fact that because it can take so many shapes, establishing specific theoretical underpinnings has proven difficult (Coakley, 2009). Positive deviance, specifically disordered eating behaviors, does seem to mirror certain aspects of Robert Merton's Strain Theory (1938), Chicago School's symbolic interactionism (Blumer, 1969), and victimological perspectives (Young, 1991 as cited in Atkinson & Young, 2008).

While the sheer number of theories used to explain deviance in sport can be overwhelming, the above are relevant to this research as they can explain many of the variations within disordered eating behaviors and the importance of perceptions on action. For instance, the very concept of positive deviance does align itself with the concept of innovation from Strain Theory whereby individuals who wish to conform to the norms of a society but lack the resources to do so will invent new ways to conform,

often regardless of consequences (as cited in Atkinson & Young, 2008). Symbolic interactionism works to explain positive deviance as it emphasizes the importance of individuals' perceptions of the values and expectations of a subculture and the power of that sport subculture in shaping behavior (Coakley, 2009). Additionally, while victimological perspectives are often reserved for athletes who are forced to play while injured, some athletes who believe they might be benched due to failure to lose weight may adopt the victim mentality as well.

Disordered eating has traditionally been conceptualized as a form of positive deviance because such behaviors are likely done in an effort to comply with the norms of the sport ethic (Atkinson & Young, 2008; Hughes & Coakley, 1991). In fact, research on this form of positive deviance goes back to the mid-1980s when Nash (1987) investigated the similarities between distance runners and anorexic nonathletes. Even prior to that study, researchers found that 32% of female athletes at a major university admitted to pathogenic weight loss methods during their time as sport participants (Rosen, McKeag, Hough, & Curley, 1986 as cited in Hughes & Coakley, 1991). In an athlete's quest to gain acceptance and approval as "athlete," she sacrifices her body (in the form of food restriction and other pathogenic weight loss methods to lose weight), learns to believe that lower weight is a necessary requirement to success, accepts the health risks and plays through pain in an effort to achieve distinction, and refuses to accept limits in the pursuit of that distinction—such as the limit of her body as it is.

In an effort to better understand the nature of the relationship between perceived coach pressure to lose weight or maintain a low body weight and disordered eating, the

coach-athlete partnership was introduced as a second variable of investigation. Support for the inclusion of the coach-athlete partnership is provided by the Integrated Research Model of Coach-Athlete Relationships (Jowett & Poczwardowski, 2007). In essence, antecedents—in this case, the sport ethic and subsequent coach behaviors—influence the coach-athlete partnership. The coach-athlete partnership then influences outcomes—like disordered eating behaviors. Therefore, the influence of the coach-athlete partnership, as indicated by the Integrated Research Model of Coach-Athlete Relationships, was deemed a necessary factor in understanding the relationship between perceived coach pressure to lose weight or maintain a low body weight and disordered eating behaviors.

Subculture of Sport

Drawn from the sport ethic in America, the subculture of each sport varies slightly and has a strong, albeit indirect, influence on sporting behaviors. Although this overall expectation of what an athlete must do to succeed in sport in general may impact weight control behaviors in athletes (Johns, 1998), the subculture of that athlete's specific sport may have a more profound impact on eating behaviors in athletes (Thompson & Sherman, 1993).

Such subcultures may focus intently on the body, body weight, and appearance in an effort to achieve perfection (Petrie & Greenleaf, 2007) and be seen as "normal and expected" aspects of the sport in which they participate (Johns, 1998). For instance, there are certain expectations for female athletes in sports like gymnastics and diving to conform to certain weight ideals in an effort to perfect body lines and improve the subjective judging scores associated with performance in their sport. As such, they may

strive for a low body weight, and accept various unhealthy weight control strategies, as a means to be as lean as possible to better execute those lines. Conversely, sports like cross country may have certain weight ideals in order to improve endurance—and would thus emphasize efforts to decrease weight to minimize the energy required to run long distances—or sports like volleyball may have certain expectations to improve power—where the expectation is to reduce fat while increasing muscle. To make matters worse, with the acceptance of this subculture of sport, the athlete's behaviors may go completely unnoticed (Sherman & Thompson, 2001).

Social Cognitive Theory (Bandura, 1989; National Cancer Institute, 2005) also offers insight into the cycle of how the environment influences an individual's behaviors, which then influences the individual—or vice versa. As such, if the subculture of a sport finds pathogenic weight loss methods acceptable, the athlete might assume that the coach knows what behaviors she is participating in and if the coach does not directly address them, the athlete may believe that she is condoning the use of those behaviors. As Thompson and Sherman (2010) point out, "when risky behaviors are accepted as a normal part of a sport, they become more of a risk because the sports[wo]men assume they are 'okay' because 'everybody does it' and apparently have been doing so for many years" (p. 76).

Moreover, athletes may even understand that such behaviors are not accepted in the general public, but their private acceptance in the sport world, combined with the fact that many other athletes take part in an effort to stay competitive, may reinforce their desire to continue using such behaviors in an effort to remain on the team. By doing so,

and retaining her position on the team, the athlete may be reinforced to continue her weight-control behaviors and her sense of guilt about employing detrimental strategies to control her weight is replaced by a sense of achievement (Johns, 1998). Additionally, as Social Cognitive Theory is a reciprocal relationship (National Cancer Institute, 2005), the success of athletic performance may also reinforce the subcultural beliefs (on the team and with the coach) that reduced weight invariably enhances performance.

Beliefs about Weight and Performance

While it is beneficial to understand the theory behind how overconformity occurs and the consequences of that overconformity, as well as the influence of distinctive subcultures unique to each sport, one must understand what norms female athletes are attempting to conform to. To accomplish this, beliefs about weight in relation to sport must be understood as they impact the subculture of sport and the sport ethic itself. One such norm can be ascribed to the misconception among some coaches and athletes that a lower body weight will positively affect performance either by improving physical ability or by providing an appearance advantage (Beals, 2004; Brownell, Rodin, & Wilmore, 1987; Dosil, 2008; Johns, 1998; Thompson & Sherman, 1999; 2010). According to one athlete, losing her meet was a direct result of not losing the right amount of weight: "I lost the meet. I hadn't lost as much weight as coach said I should. I felt so undisciplined. That's when I started the laxatives" (Wrisberg, 1996, p. 403).

Athletes and coaches who share this sentiment truly believe that any increase in weight, however small it might be, will ultimately have a negative affect on performance. Although the sentiment of this athlete, and others like her, reflects the pervasive opinion

that reduced weight enhances performance, the truth of the matter is that in sports, like gymnastics, there is a curvilinear relationship between body mass index and performance. That is, although performance is generally associated with lower weight, it is negatively affected by continued weight loss. Additionally, research on distance runners has revealed that there is no discernable relationship between low weight and increased performance (as cited in Thompson & Sherman, 2010).

Though some personal reports from athletes and coaches indicate that weight loss actually improves performance, the effects of such an improvement in performance are short-lived (Beals, 2004). Initially, the athlete will experience physical changes like a fight-or-flight response, a transient increase in VO_2 Max, and a feeling of being lighter. Over time, however, chronic energy restriction will take its toll on the athlete both physically and mentally, and performance will suffer (Beals, 2004). The athlete may experience dehydration, loss of lean body mass, reduced cardiac output and loss of cardiac tissue, fatigue, nutrient deficiencies, and irreversible loss in bone mineral density and basal metabolism (Beals, 2004; Thompson & Sherman, 2010).

Although weight loss in athletes can result in lower blood pressure than athletes of normal weight, weight cycling—or the act of dropping weight for a period of time and returning to a higher weight, then continuing the cycle—has been shown to actually increase blood pressure, thus increasing the athlete's long-term risk of hypertension later in life (Brownell et al., 1987). Other long-term consequences may include the body's tendency to protect food stores and learn to perform on fewer calories, a compromised reproductive system, different fat distribution, and ultimately increased risk of coronary

heart disease, atherosclerosis, and renal disease and failure (Beals, 2004; Brownell et al., 1987). Psychologically, the athlete may become irritable and find it difficult to concentrate, which may result in an increased risk of injury (Beals, 2004; Ransdell & Petuchroff, 2007). As evidenced above, the consequences of disordered eating behaviors can be severe and persistent.

Consequently, understanding the triggers for such behaviors and preventing the development of disordered eating behaviors is in every athlete's best interest. Without this understanding, incorrect belief systems about weight and performance are perpetuated. Perhaps athletes and coaches who wish to adopt a better outlook on weight and performance could take direction from Wilmore (1992) who recommended that emphasizing leanness over body weight to improve performance is a more accurate and healthier alternative (Thompson & Sherman, 2010).

Disordered Eating

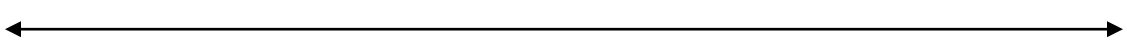
To understand, classify, and treat eating disorders, two perspectives have been offered: the continuum framework and the categorical framework. The former is the more recent view of eating disorders and will be the focus of this thesis, as its implications provide a more general understanding of the nature of eating disorders and disordered eating behaviors in this population. The latter, the categorical framework, is the traditional view of eating disorders and will be discussed in an effort to operationalize the types of eating disorders salient to this population.

As mentioned, eating disorders have been conceptualized as existing on a continuum of degree of severity (Tylka & Subich, 1999). In this orientation, clinical

bulimia nervosa and clinical anorexia nervosa are located at the extremes of the continuum and normal eating behaviors are at the center (see Figure 2.1). Because an athlete can fall anywhere on this continuum, it is important to distinguish between the different categories of eating disturbances—that indicate a difference in severity.

To be diagnosed with an eating disorder, stringent criteria established by the *Diagnostic and Statistical Manual of Mental Disorders*, 4th ed. (DSM-IV) must be met. According to the fourth edition of the DSM, there are three categories of eating disorders (American Psychiatric Association, 1994). A diagnosis of anorexia nervosa requires individuals be less than 85% of the "normal" weight for height, have an intense fear of gaining weight, have not had menses for 3 or more months, and have a distorted body image. In order to be diagnosed with bulimia nervosa, the individual must experience binge and purge cycles twice a week for at least 3 months, and must base self-evaluations on a distorted body image. An Eating Disorders Not Otherwise Specified (EDNOS) diagnosis may include those individuals who meet some criteria for either anorexia nervosa or bulimia nervosa, but fail to meet every criterion. These individuals may have some combination of anorexia and bulimia or may have what is known as binge eating disorder (1994).

According to Black and Held (1991), "there are far more [female] athletes who



Bulimia nervosa Subclinical Normal Subclinical Anorexia Nervosa

Figure 2.1. Eating disorder continuum, adapted from Tylka & Subich (1999).

engage in behaviors and attitudes and use weight loss methods that are unhealthy than there are athletes who are eating disordered" (p. 30). Clinical eating disorder diagnoses only occur in 2-12% of athletes (Cogan, 2004; Greenleaf et al., 2009); however, although many athletes do not meet these stringent criteria, eating disorder symptomology may still be present. As a result, some athletes may be classified as "subclinical." These athletes exhibit certain DSM-IV criteria, but do not meet a full diagnosis. Regardless, athletes categorized as "subclinical" still experience severe psychological, physical, and behavioral consequences that are present in clinical eating disorders (Petrie & Greenleaf, 2007).

Although recent evidence shows that 2% to 12% of female athletes have a clinical eating disorder (Cogan, 2004; Greenleaf et al., 2009), an additional 20% to 60% exhibit disordered eating behaviors (Cogan, 2004; Sanford-Martens et al., 2005). A meta-analysis by Smolak, Murnen, and Ruble (2000) found that based on 34 studies, the risk of disordered eating behavior development in female athletes was significantly higher than in nonathletes in the college setting. This is worrisome, given the possibility of those behaviors escalating into a diagnosable eating disorder (Ransdell & Petuchroff, 2007).

A necessary step to understand the nature of the relationship between perceived coach pressure to lose weight or maintain a low body weight and disordered eating behaviors in an effort to better understand such behaviors, is to identify common characteristics between athletes who use these behaviors to facilitate weight management and disordered eating individuals. Recent research has done just that, examining what characteristics athletes with subclinical eating disorders have in common with individuals

in the general population who have eating disorders (Beals & Manore, 2000). This research reflects many of the same characteristics utilized as diagnostic criteria for eating disorders such as:

> (a) preoccupation with food, energy intake, and body weight; (b) distorted body image and body weight dissatisfaction; (c) undue influence of body weight on self-evaluation; (d) intense fear of gaining weight even though at or slightly below (~5%) normal weight; (e) attempts to lose weight using one or more pathogenic weight control methods; (f) food intake governed by strict dietary rules, accompanied by extreme feelings of guilt and self-hatred upon breaking a rule; (g) absence of medical disorder to explain energy restriction, weight loss, or maintenance of low body weight (p. 128).

These findings bolster the assertion by some researchers (e.g., Black & Held, 1991) that athletes may display disordered eating behaviors and attitudes without necessarily meeting a clinically significant threshold. As such, the need for a broader construct to identify and understand these individuals is necessary.

The term "disordered eating" has gained popularity in recent years due to its ability to categorize a continuum of eating disorders, allowing practitioners to treat athletes based on degree of disturbance instead of diagnosis (Tylka & Subich, 2002). Unfortunately, disordered eating lacks a universally accepted definition, a problem that plagues researchers in the field (Petrie & Greenleaf, 2007). Therefore, it has been described several ways. For instance, it has been described as including irregular dieting patterns or subclinical disordered eating patterns that do not occur as often or as severely as those found in individuals with clinical diagnoses (Cogan, 2005; Milligan & Pritchard, 2006; Reel & Beals, 2009). Disordered eating has also been defined by the American College of Sports Medicine as "a wide spectrum of harmful and often ineffective eating

behaviours in attempts to lose weight or achieve a lean appearance. The spectrum of behaviours ranges in severity from restricting food intake to bingeing and purging…" (as cited in deBruin, Bakker, & Oudejans, 2009, p. 72).

Although there is no single, universally accepted definition of "disordered eating," the important thing to remember is that it encompasses a spectrum of abnormal eating habits and is less restrictive than that required for diagnosis (Kerr et al., 2006; Petrie & Greenleaf, 2007). This term's ability to include subclinical eating disorders—as it is sometimes known (Scoffier, Maiano, & Arripe-Longueville, 2010)—as well as clinical eating disorders in one construct, prompted the use of disordered eating as the focus of this study as opposed to the more restrictive designations of clinical or subclinical eating disorders. Additionally, the inclusivity of the disordered eating construct also broadens the population of study to individuals who do not meet diagnostic criteria but still suffer health consequences.

Sport Participation as a Risk Factor

For a variety of reasons, sport participation has been identified as a risk factor in adopting disordered eating patterns and/or developing an eating disorder. Based on a meta-analysis of 92 studies, Hausenblas and Carron (1999) identified several factors unique to sport that contributed to this risk. The athletes reported that contributing factors include the following: (a) sociocultural factors (such as societal norms on ideal body shapes for particular sports); (b) pressures unique to the sport (including sport subculture and coach pressure); (c) exercise and physical activity influences (as the individual's exercise increases, appetite decreases, decreasing the amount of food

consumed, resulting in weight loss, which reinforces the behavior, and so on); and (d) intrapersonal factors, in which individuals who excel in athletics share intrapersonal traits similar to those found in individuals with eating disorders (e.g. "perfectionism, compulsiveness, self-motivation, high achievement expectations"; Thompson & Sherman, 1999, p. 231).

In a 1999 study, Thompson and Sherman investigated these intrapersonal factors and found several parallels between anorexics and "good athletes." Before exploring these similarities, it is important to understand that the authors did not suggest that athletes who exhibit these behaviors are guaranteed to develop eating disorders; rather, that the same or similar traits that help athletes achieve success are present in nonathletic eating disordered patients (Thompson & Sherman, 2010). Additionally, the term "good athlete" is meant to describe an athlete who "works harder and longer than others, denies (and plays with) pain and injury, is selflessly committed to the team, complies with all coaching instructions, is satisfied with nothing less than perfection, and is willing to perform better," all of which create the coach's dream athlete (p. 66). Again, this term reflects positive deviance and the influence of the sport ethic.

Thompson and Sherman's (2010) research found that both athletes and anorexic nonathletes are highly committed to train hard and push their physical limits in order to achieve their preferred outcome. The fact that athletes and anorexics share a strong drive for perfectionism may aid them in persisting through adversity and pain. Both populations employed similar strategies, such as increased discipline, ultimate control, and being detached from their feelings in order to produce their desired goals. Such

parallels are evidenced when comparing how athletes sacrifice their bodies to make a play with the tendency of anorexics to ignore pain and hunger so they can continue to drop weight.

The desire to please is another common trait of both anorexics and athletes. In athletics, this compliance to whatever the coach asks may make the athlete seem highly coachable; because anorexics have a desire to please others, they may seem unselfish. In fact, athletes who demonstrate this mentality are seen as real team players, reinforcing the "good athlete" façade. Given the similarities between anorexics and "good athletes," an athlete with an eating disorder may not be perceived as problematic (Thompson & Sherman, 1999). Instead, the athlete may be seen as the coach's dream athlete, which may make detection, by the coach or support system, of emerging problem behaviors difficult.

Existing Research

In evaluating the existing research on disordered eating and eating disorders in athletes, two important considerations should remain salient: (1) due to differences in measurement instruments and techniques (e.g., clinical interviews versus self-report questionnaires), there is a wide range of reported prevalence rates; and (2) the type of sport examined will have an impact on reported prevalence rates (e.g., aesthetic and endurance sports typically report higher rates of disordered eating behaviors than power or ball sports; Smolak et al., 2000). These limitations should be taken into account when interpreting research in this area.

Miller and Black (1991) suggested that athletes may be more susceptible to developing eating disorders, given "stress related to athletic and academic performance, desire to please, and insecurities associated with attempts to comply with the expectations of others" (p. 12), such as the coach. One of the earliest large-scale studies to discover the prevalence of eating disorders in college athletes was conducted by Johnson, Powers, and Dick in 1999 for the NCAA. In that study, the researchers found that 12% of the female athletes from 11 NCAA Division I institutions surveyed had "clinically significant problems" with eating disorders, but did not meet criteria for diagnosis. They also found that 34.75% of the athletes were at risk for anorexia nervosa and 38% were at risk for bulimia nervosa.

In the previously mentioned meta-analysis by Smolak et al. (2000), the researchers found that not only were athletes' risk of eating disorders significantly higher than their nonathlete counterparts ($d = .22$, $z = 6.84$, $p < .001$), but that athletes in lean sports, such as gymnastics, diving, and figure skating, seem to be at increased risk in comparison to nonathletes ($d = .28$, $z = 8.70$, $p < .001$). They also found that elite-level athletes were especially at risk compared to nonathletes ($d = .52$, $z = 12.18$, $p < .001$).

The most recent multisite study published on the prevalence of eating disorders (Greenleaf et al., 2009) and disordered eating in college female athletes noted an increase from the 1999 study. Results from athletes of three Division I universities revealed that 2% of the athletes had a clinical eating disorder and 25% involved were symptomatic of an eating disorder (Greenleaf et al., 2009). In interpreting these statistics, it is important to note that underreporting has been observed for decades by researchers interested in

disordered eating behaviors in athletes (Beals, 2004; Greenleaf et al., 2009; Reel & Gill, 1996). Therefore, actual prevalence rates may be higher than what has been reported. Regardless, the recently reported 27% prevalence rate of disordered eating behaviors in athletes warrants exploration into possible influential factors that have yet to be researched.

Potential Confounders of Disordered Eating Behavior Acquisition

Many factors can influence the development of disordered eating behaviors in athletes, including intrapersonal, family issues, sport type and environment, and the like (Thompson & Sherman, 2010). Because controlling for every conceivable confounding factor is not feasible, some possible confounding variables to this study should be acknowledged. Though they are not exhaustive, the following factors are likely the most relevant to the current proposed research.

Contagion effect. Due to various social reasons and motivations, athletes have a tendency to model each other's behavior. According to Crandall (1988), "social pressures in groups (i.e., athletic teams) arising from social norms in the group regarding eating can lead group members to engage in behaviors consistent with those norms" (as cited in Thompson & Sherman, 2010, p.74). Sherman and Thompson (2001) cited the presence of this "contagion effect" in disordered eating behavior research, such that they may spread through a team when they are not addressed. Essentially, if an athlete believes that other athletes are performing the same behaviors, and have been doing so for years without consequence, she is more likely to perform the same disordered eating behaviors (Thompson & Sherman, 2010).

The mechanism by which the contagion effect occurs is that the information, or secret, is passed down through direct communication or observation of a veteran teammate to rookie and between friends (Cogan, 2004; Reel & Beals, 2009). The athlete may engage in disordered eating behaviors because she sees another role model performing them, or other team members may openly encourage it (Thompson & Sherman, 2010). Similarly, engaging in such behaviors may be a way to bond or gain acceptance into a group (Black & Held, 1991)—acceptance which is granted only as individuals demonstrate their commitment to the sport by striving to lose weight (Johns, 1998). Consequently, these individuals may adopt disordered eating patterns "ritualistically and unquestioningly" in order to gain peer approval and acceptance from teammates and/or coaches (p. 50).

When this mentality occurs with enough athletes who adopt the now-accepted disordered eating behaviors, a majority of the team may exhibit similar negative eating or exercise habits. Although this phenomenon can be tied back to the greater concept of sport ethic, the contagion effect is considered a more salient confounder to the current research as it involves some active decision-making by members of the team to participate in eating and exercise behaviors they would otherwise accept as "wrong" (Johns, 1998). In fact, as more members of the team learn and practice maladaptive behaviors in the presence of each other, they may experience an increased sense of loyalty, a strong need to continue employing those behaviors, and the need to protect others participating in similar practices. This then creates a "team ethic" where it may be

difficult to detect and treat disordered eating behaviors in team members (Johns, 1998, p. 49).

Goal orientation. As with anything in life, motivation plays a major role in our actions. Therefore, the influence of an athlete's goal orientation, as described in the Achievement Goal framework, cannot be overlooked. Two types of goal orientation exist in this framework of motivation: task-orientation and ego-orientation. Task-orientation focuses on the mastery of skills and self-improvement, gauging success by progress seen in skill development and mastery. Ego-orientation focuses on the outcome (e.g., winning or being the best) in comparison to others regardless of personal potential (deBruin et al., 2009). Research investigating goal orientation in athletes with eating disorders reveals that if an athlete is ego-oriented, equating winning with social approval, and willing to do whatever it takes to gain that approval, she will be more likely to participate in disordered eating and other unhealthy behaviors (Jones, Glintmeyer, & McKenzie, 2005; Krane et al., 1997; Waldron & Krane, 2005).

Because ego-orientation is based on the athlete's need to compare herself with others and to win at all costs, it has been associated with disordered eating behaviors in athletes (deBruin et al., 2009). The ego-oriented athlete believes that she must be the best at whatever she does and that she must do it with as little effort as possible. Ego-oriented athletes may believe that the coach knows what they should do in order to enhance performance, including the recommendation for weight loss, and that failure to follow those recommendations will result in performance failure (Brownell, Rodin, & Wilmore, 1992). The combination of an athlete's emphasis on winning at all costs with the belief

that the coach possesses the secret to obtaining that success may complicate the athlete's predisposition to disordered eating behaviors.

The Role of the Coach

Research has long identified the coach as a causal or contributing factor in the development of disordered eating and/or eating disorders in athletes (Berry & Howe, 2000; de Bruin et al., 2009; deBruin et al., 2007; Harris & Greco, 1990; Johns, 1998; Ransdell & Petuchroff, 2007; Scoffier et al., 2010). Williams et al. (2003) found that female athletes who hear about weight concerns from others are 2.8 times more likely to develop subclinical eating disorders. For this population, the coach was chosen as a central factor of the current study because, although parents can influence athletes' self-worth at a younger age, the coach is more influential in high school and elite levels of sport (Jowett & Cramer, 2010). Therefore, the social influence on this psychological disorder (Miller & Black, 1991) and the central role of coaches in many athletes' lives (Dosil & Gonzalez-Oya, 2008; Turk et al., 1999), indicate that coaches should be included in an investigation on athletes who exhibit disordered eating behaviors.

According to Thompson and Sherman (1993), athletes often "feel pressure from coaches to lose weight, and it is important not to underestimate the power many coaches have over their athletes" (p. 27; Thompson & Sherman, 2010). In fact, a 2006 study found that gymnasts who received detrimental comments regarding their weight, or direct instructions to lose weight, tended to believe they needed to lose weight, had more disordered eating patterns, and reported having an eating disorder more often than those athletes who did not receive such comments and/or instruction (Kerr et al., 2006).

Another study found that elite athletes' dietary patterns were more attributed to perceptions of coach pressure to lose weight than the athletes' pre-existing body image (de Bruin et al., 2007).

As evidenced above, coach pressure to lose weight or maintain low body weight can be perceived from direct (e.g., remarks, benching athletes for not making weight) or indirect (e.g., public weigh-ins, public records of weight) sources. Regardless of the method of delivery, these messages, intentional or otherwise, are likely made without mal-intent and seek to preserve what the coach believes is in the athlete's best interest:

> When an athlete is not performing as well as a coach believes he or she should, the coach will look for an explanation and a solution. It is very easy for a coach to notice what looks like fat or extra weight on an athlete… Unfortunately, too many coaches focus on what the scale reads when the athlete is weighed. In this case, the athlete may show a decrease in performance due to the loss of lean muscle tissue and fluid. (Thompson & Sherman, 1993, p. 33)

Nevertheless, inadvertent comments about weight or appearance can still contribute to problematic eating patterns (Cogan, 2004). Coaches cannot underestimate the power of a pat on the belly, an off-the-cuff comment, or misconstrued nicknames (Wrisberg, 1996). As one athlete explained, "My coach jokes about teenage girls developing hips or breasts. I don't think he has any idea how self-conscious we are about these changes. His jokes make us feel terrible" (Kerr et al., 2006, p.36).

On the other hand, some coaches may intentionally encourage unhealthy weight loss methods (Cogan, 2004). As Reel and Gill (1996) discovered, the coach may bench members for not making weight at a weekly weigh-in. Another athlete explained that "Even if coaches don't see you eating in front of them, but they see you over, say, a

period of a week during a competition, and they see that you look as if you are starving yourself when they are around, they seem to know that you are eating behind closed doors…" (Johns, 1998, p.55). That same athlete even reported that her coaches locked her team in their hotel rooms to ensure they could not eat during an international competition.

Direct comments from coaches that recommend their athletes lose weight are important to recognize because 48% and 50% of athletes who recall these comments from their coaches reported feeling upset and more self-conscious, respectively, about their bodies (Muscat & Long, 2008). About the same percentage of athletes also reported that those comments had "quite a bit/a lot" of impact on their attitudes and behaviors toward their bodies. These athletes also had significantly more disordered eating behaviors than athletes who did not recall direct comments from their coaches to lose weight (F (1, 217) = 12.25, $p < .001$).

Although coach pressure can be a direct comment or an indirect look or gesture, the pressure athletes feel from their coaches can also be imagined. That is, it may be a product of the athlete's perception of the situation in the absence of evidence (e.g., recommendations from *that* coach, nicknames from *that* coach, punishments for other athletes based on weight employed by *that* coach). Sometimes, athletes may form ideas about what their coach wants in terms of weight based on past experience with teammates, family, or previous coaches. As a result, they may adopt strict diets, workout schedules, or other inappropriate weight loss strategies in an effort to please *that* coach according to what they believe *that* coach wants (Dosil & Gonzalez-Oya, 2008).

For example, some athletes attribute the emotional distance they feel from their coaches to unfounded perceptions that the coach believes they are overweight. As one athlete described, "the coach doesn't want to deal with you if you are overweight" (Wrisberg, 1996, p. 403). In reality, the tension this athlete felt could have been from a number of different sources, but her perception of the situation was that the distance was a direct result of her failure to lose "extra" weight. Unfortunately, these perceptions of coach pressure can be equally as devastating as direct recommendations or requests to lose weight (Dosil & Gonzalez-Oya, 2008).

All too often, athletes resort to unhealthy behaviors, including competing while seriously injured, unhealthy eating and/or exercise behaviors, overtraining, and refusing to listen to medical personnel (Krane et al., 1997). The likelihood of resorting to these behaviors is often increased when an athlete "uncritically accepts" the coach's ideas of what behaviors will improve performance (Waldron & Krane, 2005). This "uncritical acceptance" likely stems from athletes' ideas that the coach always knows best; the desire to please the coach to any end may affect the athlete's ability to truly analyze and question the need for those behaviors.

According to "Anne," an elite swimmer who has lived with bulimia nervosa since she was 14 years old, her coach may have had a hand in either contributing to or allowing unhealthy behaviors to occur (Jones et al., 2005). As Anne remembers, "[the coach] kept putting pressure on us by decreasing our target times and telling us what we should be eating and stuff" (p. 383). Anne was a people-pleaser; she wanted to succeed to please her parents, and when she met her new coach, she wanted to do whatever it took to please

him. Because Anne valued her relationship with her coach and respected his opinion, she allowed her self-worth to become tied up in his approval. When he had a meeting with her and her parents and told her "it would probably be more beneficial if you were lighter and slimmer and could lose a bit of weight and maybe you should look at dieting a bit more" (p. 384), Anne's image of herself was shattered. Within a month, she developed bulimia nervosa; although she is now retired from the sport, she still battles with it today. As research shows and this example illustrates, some athletes are willing to do anything to please their coaches (Dosil, 2008; Thompson & Sherman, 1993; Zahensky, 2009).

In another case study, "Susan," an elite gymnast, eventually developed disordered eating behaviors as a result of the requests of coaches to ignore pain and lose weight (Krane et al., 1997). Susan was one of the "good athletes" who played through pain, ignored medical advice to stop training when injured, and habitually over-trained. She saw her coaches as "gods" (p. 59). They placed such importance on comparison and perfection that they fostered an environment of extreme ego-orientation; a fact that led her to endure cruel training regimes, accept nothing less than first place, and partake in disordered eating behaviors. Her coach would require the gymnasts to keep a food diary and would employ social humiliation when they were not eating correctly. When the athletes failed to compete to perfection, they were physically punished with overtraining and conditioning. Because of predisposing factors and the ego-involving environment in which she was submersed, Susan accepted these strict schedules and rules without question (Krane et al., 1997). Although Susan never developed a clinical eating disorder as a result of this acceptance, the physical and mental repercussions are no less important.

Though these cases are not typical of every female athlete who has ever had a coach ask her to lose weight, and it is likely that their development of disordered eating patterns was not solely contingent upon what their coaches asked of them, it is all too common for coaches to impose weight ideals on their athletes (Reel & Galli, 2006; Reel & Gill, 1996). Regardless of the notion that such impositions might be rooted in the subculture of the sport, in personal philosophies and experiences, or in misguided information, it is evident by the aforementioned studies, it does occur.

The Coach-Athlete Partnership

The coach-athlete partnership is a complex, multidimensional connection between athletes and their coaches. It is defined as a "situation in which coaches' and athletes' emotions, thoughts, and behaviors are mutually and causally interconnected" (Jowett & Ntoumanis, 2004, p. 245). This partnership is influenced by many different factors in the social and sport world, including parents, administrators, fans, motivation, and passion (Jowett, 2008; Jowett & Timson-Katchis, 2005; Lafreniere, Jowett, Vallerand, Donahue, & Lorimer, 2008).

Theoretically, the coach-athlete partnership is defined in terms of the 3 + 1 C's model (Jowett, 2009). This model describes the components of the coach-athlete relationship as closeness, commitment, and complementarity, as well as co-orientation, or the ability to empathize with the other.

Closeness refers to the emotions associated with the coach-athlete partnership. It is feeling emotionally close or feeling connected with one another (Jowett & Ntoumanis, 2004). Based on case studies (Jones et al., 2005; Krane et al., 1997) and existing

research on the coach-athlete partnership (LaVoi, 2007), it was hypothesized to be likely that the closeness dimension would be the most likely to affect the relationship between perceived coach pressure and disordered eating behaviors in athletes (Jowett & Ntoumanis, 2004). The second dimension, commitment, includes the intentions of coaches and athletes to continue the relationship in the foreseeable future (2004); it is the thoughts portion of the coach-athlete partnership definition. The third component of the coach-athlete partnership is complementarity. It examines the behaviors of both the coach and the athlete in their attempts to move toward a common goal; it is concerned with "cooperative interactions" between the coach and the athlete (2004).

The coach-athlete partnership has been described as similar to a number of other relationships present in the athlete's life. As Jowett and Timson-Katchis (2005) pointed out, coach-athlete partnerships have characteristics of "(a) marital relationships, such as affection, intimacy, and commitment; (b) friendships, such as trust, honesty, and tolerance; and, (c) work relations, such as instructional support, sharing news, and respecting privacy" (p. 268). Given the multiple characteristics involved in the coach-athlete partnership, it seems that the coach facilitates many roles in the athlete's life. As such, the more roles that the coach fulfills for the athlete, the more influential eating and/or weight control recommendations might be.

It was selected for exploration in this study for the following reasons: (a) "our relationships with others (more so those relationships that we perceive as close and significant) affect our views about ourselves" (Jowett & Ntoumanis, 2004, p. 246); (b) "feelings of being cared for, liked, and valued, as well as the ability to trust one another

ha[ve] an affirmative effect on coaches' and athletes' intrapersonal (e.g., creativity, determination) factors" (p. 246); and (c) according to the commitment component of the coach-athlete partnership, effective communication between the athlete and the coach improves conflict resolution (Jowett & Ntoumanis, 2004). To address the first issue, if self-perceptions and body image are of central importance in the development of eating disorders and disordered eating behaviors (Thompson & Sherman, 2010), and those perceptions are influenced by our relationships with others (Jowett & Ntoumanis, 2004), it is logical to study the relationships that could have a significant impact on those perceptions. Regarding the second reason, it has long been the focus of sport psychology to study the intrapersonal factors associated with athletic performance and success, such as motivation, concentration, and anxiety management. If significant relationships, such as the coach-athlete partnership, have an impact on these intrapersonal factors (Jowett & Ntoumanis, 2004), it is necessary to explore these possible relationships to develop a broader understanding of how these intrapersonal factors are developed and maintained. Finally, if good communication skills contribute to commitment (Jowett & Ntoumanis, 2004), and possessing those skills allows the coach and/or athlete to effectively resolve conflict, it would seem important to have this component well-established within the relationship and to allow the athlete the freedom to discuss problems and seek help for other issues in her life.

It is important to note that a person's perceptions of another's actions, not the other's actual actions, determine that individual's feelings and actions toward the other (Horne & Carron, 1985) as seen in the closeness and complementarity constructs.

Therefore, this study focused on the athlete's perceptions of the coach-athlete relationship and the athlete's perceptions of coach pressure to lose weight or maintain a low body weight, not the actual relationship or actual pressure. The coach-athlete partnership is still in the early stages of exploration and measurement tools are still being created and validated. Therefore, there are still many possible avenues for future research. According to one researcher in the field, future research should focus on the outcomes of the coach-athlete partnership (Jowett, 2009).

Although previous research has implicated coach pressure to lose weight or maintain a low body weight, as well as the confounding factors of sport ethic and subcultures of sport, on disordered eating behaviors, it has failed to explore the influence of the relationship between the coach and the athlete on the relationship between perceived coach pressure and disordered eating behaviors. As such, the coach-athlete partnership is one element that makes this study unique.

To date, one published study has investigated the direct effect of the coach-athlete partnership on body image. Jowett and Cramer (2010) found that youth athletes' perceptions of their physical bodies were predicted by their relationships with their coaches, accounting for 25% of the variance in athletes' perceptions of their bodies. While this line of research is promising in the field of disordered eating behaviors, it may be missing a piece of the puzzle. Previous research has established that some athletes who exhibit disordered eating behaviors perceive pressure from coaches to lose weight or maintain a low body weight (de Bruin et al., 2007; Thompson & Sherman, 2010); however, no studies have examined the effect of the partnership on the nature of the

relationship between perceived coach pressure to lose weight or maintain a low body weight and disordered eating behaviors. The absence of such research has made it difficult to ascertain the role of the coach-athlete partnership in the prevention or exacerbation of disordered eating behaviors.

According to Jones et al. (2005), the coach-athlete partnership remains under-researched. Previous research has aimed to identify the meaning of the relationship (Poczwardowski et al., 2002), or the "power" a coach has over an athlete (Brownell et al., 1992). According to Brownell et al. (1992), athletes may exhibit "unconditional obedience" and have an intense fear that "failure to comply with the coach's wishes will result in… performance failure" (p. 278). This "unconditional obedience" may be linked to the behavioral aspect of the coach-athlete partnership or complementarity. However, research in this area, and its possible effect on disordered eating behaviors, is sparse at best. Therefore, current research offers few connections between disordered eating behaviors and the coach-athlete partnership, making it difficult to implicate the coach-athlete relationship as a contributor to disordered eating behaviors in athletes.

CHAPTER 3

METHODS

Given the ethical considerations inherent in studying disordered eating behaviors, and the sensitivity of the subject, it was inappropriate to use an experimental design. As a result, this study aimed to capture the nature of the relationship between perceived coach pressure and disordered eating behaviors, and the role of the coach-athlete partnership, as perceived by the athlete, on that relationship, while preserving the integrity of all individuals involved. This study was designed with these considerations in mind.

Participants

After obtaining approval from the Institutional Review Board at two NCAA Division I universities, female collegiate athletes were recruited for the study. Participants for this study included women, at least 18 years of age, who participated in collegiate athletics or cheer/dance teams at four universities in the Western United States (N = 248). At many universities, Spirit Squad teams include dance lines and cheerleading squads; these two teams were collectively referred to as "Spirit Squad" teams for the purposes of this study. Participants under the age of 18 were not considered for this study due to issues with parental consent.

Instruments

The questionnaire packet for this study contained demographic questions, the Coach-Athlete Relationship Questionnaire (CART-Q; Jowett & Ntoumanis, 2004), the 26 item Eating Attitudes Test (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982), and Weight Pressures in Sport for Females Questionnaire (WPS-F; Reel et al., 2010). These instruments measured the strength of the coach-athlete partnership, as perceived by the athlete, the athlete's beliefs and behaviors related to eating, and the athlete's perceived pressures present in sport, respectively.

Demographics

Demographic questions included information about the participant's age and ethnicity, her current sport, and her experience in that sport, as well as current height and weight. Demographic information served to provide descriptive information about the population; it did not identify the athlete in any way.

This section asked a few questions about the motivation of the athlete to participate, as well as discussions she has or has not had with teammates about weight loss and/or strategies to achieve that goal. These questions were by no means exhaustive enough to get a clear picture of possible confounding factors the athlete may be dealing with; however, it gave the researcher a rough idea. Athletes were also asked about their previous history with coach pressure and disordered eating habits as well as family and team history with eating disorders. They were asked to provide a short explanation if they experienced weight-related pressure from a previous coach or if they had weight-related discussions with teammates that involved sharing weight-loss methods.

Participants were also asked information about the coach they identified as most influential in their performance success or failure.

CART-Q

The CART-Q, developed by Jowett and Ntoumanis in 2004, measured cognitive, affective, and behavioral aspects of the coach-athlete partnership in terms of commitment, closeness, and complementarity, respectively. This questionnaire was developed to further our understanding of the dynamics inherent in the coach-athlete partnership (Jowett & Ntoumanis, 2004). This instrument assessed coaches' and athletes' feelings, thoughts, and behaviors in order to "provide a vehicle for studying associations between the nature of the coach-athlete relationship and personal… situational… and other important variables" (p. 246). To accomplish this goal, researchers offered four versions of the CART-Q. The first two addressed either the coach's or athlete's direct perspective of the other. For instance, this version would measure "I like my coach/athlete." The second two versions addressed the meta-perspective of the relationship; that is, how the coach or athlete believes the other perceives him/her. A question from this type of perspective would be "My coach likes me" (Jowett, 2009). As the focus of this study was to investigate the athlete's perceptions of coach pressure and the coach-athlete partnership, only the direct perspective version for the athlete was included in the questionnaire packet. Questions in this version of the CART-Q reflected the athlete's thoughts, feelings, and behaviors toward her coach. For instance, she was asked to rank her level of agreement with the statement "I respect my coach" or "When I am with my coach, I feel at ease."

The measure consisted of 11 items, rated on a 7-point Likert-type scale ranging from 1 (*not at all*) to 7 (*extremely*) with a midpoint of 4 (*half-way*). Convergent validity for each of the subscales was 0.61, 0.66, and 0.67, respectively. Internal consistency for the measure was established with a Cronbach's alpha of 0.93. The subscales exhibited $\alpha = 0.82$ for commitment, $\alpha = 0.87$ for closeness, and $\alpha = .88$ for complementarity (Jowett & Ntoumanis, 2004).

Given the lack of direction provided by current research to explain what, if any, subscales may provide a greater impact on the relationship between perceived coach pressure to lose weight or maintain a low body weight and athletes' disordered eating behaviors, the composite score of the CART-Q was utilized to gain an overall understanding of the perceived partnerships between the coach and the athlete. To interpret the composite score, higher scores were indicative of more positive relationships, whereas lower scores indicated poor relationships (Jowett & Ntoumanis, 2004). A cut-off of good versus bad relationships is not provided in the coach-athlete partnership literature; therefore, this estimation was made based on natural breaks in the data. From there, as results indicated that the coach-athlete partnership did significantly impact this relationship, a post hoc analysis was done to analyze which subscales of the CART-Q were most influential.

EAT-26

The EAT-26 was chosen because it has been used in a number ($N = 18$) of studies investigating the prevalence of disordered eating patterns in athletes from 1978 to 1998 (Hausenblas & Carron, 1999) and because it is an efficient, cost-effective screening tool

for assessing eating attitudes and behaviors (Doninger, Enders, & Burnett 2005); recent research has also utilized this instrument. Resulting scores are not indicative of eating disorder diagnosis; rather, it identifies individuals who might be at risk for such behaviors and exhibit symptoms of eating disorders. The EAT-26 ($\alpha = .90$), when used on a female collegiate athlete population, exhibited internal consistency reliabilities for subscales ranging from .70 to .88 in a five factor model. The factors included in this analysis were: (a) Drive for Thinness, "am terrified about being overweight," $\alpha = .88$; (b) Food Preoccupation, "feel that food controls my life," $\alpha = .84$; (c) Others' Perceptions, "feel that others pressure me to eat," $\alpha = .70$; (d) Purging Behaviors, "vomit after I have eaten," $\alpha = .70$; and, (e) Dieting Behaviors, "aware of calorie content in foods that I eat," $\alpha = .82$ (Doninger et al., 2005).

This 26-item questionnaire was scored on a 4-point Likert-type scale from 0 (*never, rarely, sometimes*) to 3 (*always*). Participants are asked to answer how often they agree with an item: *never, rarely, sometimes, often, usually,* or *often.* If the participant answered *never, rarely,* or *sometimes,* she was given a score of zero for that item, a score of one if she answered *often*, two if she answered *usually*, and three if she answered *always* to an item. The composite score was utilized to reach an overall clinical profile where a score of more than 20 total points is indicative of "a clinical profile suggesting the likely presence of an active eating disorder" (Doninger et al., 2005, p. 41). Because this study sought to detect athletes exhibiting maladaptive weight-control patterns, not just individuals with an active eating disorder, athletes who scored a 14 or higher were included in the disordered eating group. This score was chosen by the principle

investigator because, according to population norms, it is one standard deviation above the mean (*M = 6.97, SD = 6.99*) in the female collegiate athlete population (Doninger et al., 2005). Analysis was completed by comparing the composite score to the predictor variables of perceived coach pressure to lose weight or maintain a low body weight and perceived coach-athlete partnership strength. Once significant relationships were identified, the five factor model of the EAT-26 of Doninger et al. (2005) was utilized to perform a post hoc analysis on the resulting subscales and identify the aspects of disordered eating behaviors in athletes that are most greatly influenced by the predictor variables.

WPS-F

Coach pressure was measured using the Weight Pressures in Sport for Females Questionnaire (WPS-F; Reel et al., 2010); Cronbach's $\alpha = .90$ with a similar sample. This instrument was developed to assess the pressures athletes feel are present in their sport, as related to weight control. The original WPS-F instrument was created by adapting existing sport-specific pressure instruments including the CHEER (Reel & Gill, 1996), Weight Pressures in Swimming (Reel & Gill, 2001), SYNCHROSKATE (Greenleaf, 2004), and Weight Pressures in Dance (Reel, Soohoo, Gill, and Jamieson, 2005; as cited in Reel et al., 2010).

The resulting WPS-F included 16 items on a 6-point Likert-type scale ranging from 1 (*never*) to 6 (*always*). Questions specific to the coach include the following: "My coach notices if I gain weight," "Weigh-ins are held periodically throughout the season," and "My coach encourages female team members to maintain a below average weight."

Positive responses to these questions, indicated by answering "Always," "Usually," and "Often," were considered indicative of perceived coach pressure (Reel et al., 2010).

A 22-item version of the WPS-F, using all of the items originally used for validation of the instrument, was used in the present study to obtain more information about the participants. Additionally, the WPS-F was coded as 1 (*always*) to 6 (*never*) for the current study in an effort to reduce response bias.

Procedure

For recruitment, gatekeepers, including Athletic Department Administrators and coaches, from the four universities in the Western United States were contacted via e-mail or phone and informed about the study. Contact with these individuals served to set up meeting times with athletes and inform them about the study. At those meetings, athletes were informed of the study and assured confidentiality. Athletes were reminded that participation was voluntary and that they were free to discontinue participation at any time; they were instructed not to complete any question(s) about which they did not feel comfortable disclosing information.

Athletes were asked to read the Informed Consent cover letter and, if they felt comfortable and consented to participate, completed a questionnaire packet containing 79 survey questions and additional demographic information. Questions included in the questionnaire packet were divided by instrument and maintained the order of questions in the original instrument. A lie scale, such as the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1960), was not employed as it was speculated that the addition of 33 more questions would result in response fatigue. Therefore, it was

determined that using such a lie scale would replace one response bias with another and social desirability was deemed the least detrimental of the two as it is inherent in research on disordered eating behaviors (Hausenblas & Carron, 1999).

Although athletes were approached in a team setting (ranging from 7 to 48 athletes), they were asked to fill out the questionnaire packet separately and a short distance from each other. For some sports teams, the setting had available desks where the athletes were encouraged to sit one seat apart; other teams, however, met in a gym or on a field and were asked to sit several feet apart while completing the questionnaire packet. The principle investigator reminded each team that this was an individual assignment and if anyone had questions, she should ask the principle investigator directly instead of her teammate(s).

The questionnaire packet took approximately 20 minutes to complete. Participants were informed that there are no right or wrong answers. They were instructed to answer each question honestly or to avoid it if they felt uncomfortable providing the information requested. Athletes were also instructed not to provide any identifying information on the survey itself, including, but not limited to name, position on the team, school identification number. Because they did not provide any identifying information, there was no way to identify which, if any, athletes were at risk for eating disorders according to the EAT-26. Accordingly, the coach was never informed of the results. Local resources were provided to each participant following the study for more information about eating disorders and treatment.

During the completion process, the principle investigator was present to answer any additional questions. After completing the questionnaires, athletes returned the completed questionnaire packets in a manila folder and deposited that folder in a box near the principle investigator; athletes who chose not to complete the questionnaire were asked to follow the same procedure so that no teammates could know who completed the questionnaire packet and who elected not to. After all questionnaire packets were received for the team, they were kept in a locked desk until they could be entered and analyzed.

Design and Analysis

This study was a nonexperimental, cross-sectional, correlational design. The sample was obtained via convenience sampling. Because this was a correlational design, no control groups or randomization were employed. Data were collected via quantitative surveys, using interval data to calculate relationships. Quantitative information obtained from the surveys was entered into SPSS 18.0 for data analysis. Due to the sensitive nature of the subject, and the principle investigator's instructions to leave any questions that may cause discomfort blank, missing data were anticipated. Therefore, missing data were deleted listwise during analysis, but the remainder of the data for each individual were used in subsequent analyses. In addition, given the nature of the variables studied and previous research, outliers were anticipated in the data as well. These outliers were included in the analysis as they were assumed to be representative of the population.

The CART-Q was coded such that greater scores indicated a more positive relationship and lower scores indicated a negative coach-athlete partnership; the EAT-26

was coded such that higher scores indicated a greater frequency of disordered eating behaviors; the WPS-F, however, was reversed from the literature, and in an effort to discourage response bias, such that lower scores indicated more pressure and higher scores indicated less perceived pressure to lose weight or maintain a low body weight. Therefore, scores from the WPS-F were reverse-coded during data entry into SPSS 18.0.

Analyses included the following:

1. Reliability checks of each of the instruments to compare the fit of each to this particular sample as well as to existing research.
2. Dividing the number of athletes meeting the cutoff score for disordered eating (EAT-26 score of 14 or greater) by the number of total athletes surveyed to identify disordered eating prevalence in this sample.
3. Dividing the number of athletes reporting perceived coach pressure (WPS-F positive responses—scores of "Always," "Usually," or "Often" (Reel et al., 2010)—on questions regarding the coach) by the total number of athletes to identify the percentage of athletes in this sample who perceived pressure from coaches to lose weight or maintain low body weight.
4. Simple bivariate correlation between perceived coach pressure to lose weight or maintain a low body weight and disordered eating behaviors.
5. Simple bivariate correlation between the strength of the coach-athlete partnership (CART-Q composite scores) and perceived coach pressure to lose weight or maintain a low body weight.

6. Simple bivariate correlation between CART-Q and EAT-26 composite scores; post hoc analyses to identify which CART-Q subscales were related to disordered eating behaviors and determine if any of the subscales affected the influence of another.
7. Multiple regression using CART-Q and WPS-F composite scores as predictor variables and EAT-26 composite scores as the dependent variable.
8. Hierarchical linear regression modeling with WPS-F entered as the first-level predictor, followed by the CART-Q as the second-level predictor, and with EAT-26 as the criterion variable. Hierarchical linear regression modeling was chosen in order to assess the effect of the coach-athlete partnership on the relationship between coach pressure to lose weight or maintain a low body weight and the presence of disordered eating behaviors.

CHAPTER 4

RESULTS AND DISCUSSION

After contacting coaches from 38 female collegiate athletic teams and cheer/dance squads, 15 agreed to participate. Therefore, the response rate for coaches was 39.5%. Additionally, of those athletes who were approached about the study (N = 249), only 1 chose not to participate, resulting in a response rate of 99.6% (N = 248). All 248 cases recorded were used in the analyses, with missing data deleted listwise.

Demographics

Demographic data obtained included age, race, sport, height and weight, sport experience, years with coach, and history of eating disorders. Respondents ranged in age from 18 to 23, with a mean age of 19.63 years (SD = 1.26). Height ranged from 58 to 78 inches (M = 67.04; SD = 3.38); two athletes declined to provide their height. Average weight was 139.55 pounds (SD = 22.11), ranging from 95-220 pounds. As a result, BMI for the sample, as defined by the *ACSM Guidelines for Exercise Testing and Prescription* (Thompson, Gordon, & Pescatello, 2009), was normal (M = 21.76, SD = 2.46), ranging from 16.30 to 33.45 with a median of 21.48. Fourteen of the participants were classified as underweight, 22 were classified as overweight, and 2 as obese (both were track/cross country athletes). Of the 14 participants who were underweight, only 1 met the cut-off criteria for disordered eating behaviors as defined for this study.

Most of the sample (85.1%, *n* = 211) identified themselves as Caucasian. The remaining participants identified themselves as Asian (3.2%; *n* = 8), African American (2.8%; *n* = 7), Native American (2.8%; *n* = 7), Hispanic (1.6%; *n* = 4), or other (4.0%; *n* = 10); one participant did not identify her race.

Sports represented included the following: track and field/cross country (28.2%; *n* = 70), dance/drill team (18.1%; *n* = 45), basketball (14.9%; *n* = 37), volleyball (11.3%; *n* = 28), lacrosse (7.3%; *n* = 18), soccer (7.3%; *n* = 18), softball (6.0%; *n* = 15), swimming (6.0%; *n* = 15), and diving (0.8%; *n* = 2). When grouped by sport type for subsequent analyses, there was a disproportionate number of ball sport athletes (46.8%; *n* = 116) compared to endurance athletes (34.3%; *n* = 85) and aesthetic athletes (19.0%; *n* = 47). Number of years in sport participation varied widely. Rookies made up 47.6% of the sample (*n* = 118), second-years were 28.6% (*n* = 71), third-year athletes represented 13.3% of the sample (*n* = 33), fourth-year athletes were 8.9% (*n* = 22), and four fifth-years (1.6%). Most athletes participated in their respective sport for more than 14 years (31.9%; *n* = 79). Of the remaining athletes, 19.8% (*n* = 49) played their sport for 11-13 years, 22.6% (*n* = 56) for 7-10 years, 18.1% (*n* = 45) for 5-7 years, and 7.7% (*n* = 19) for 1 to 4 years.

Eating Disorder History

A number of questions addressing disordered eating/eating disorder history were asked. According to the EAT-26, a score greater than 20 is indicative of a possible eating disorder (Doninger et al., 2005); 4.29% (*n* = 10) of the sample met this criterion, 15 did not provide enough information to be included in the analysis. This was nearly twice that

of a recent study on eating disorder prevalence (Greenleaf et al., 2009). However, measurement differences may account for this variation. An additional 9.01% (*n* = 21) met the current study's cut-off score of 14 for disordered eating behaviors. Five athletes (2.0%) reported being previously diagnosed with an eating disorder, 2 with anorexia nervosa, 2 with bulimia nervosa, and 1 with both; two athletes declined to answer this question.

When asked if they had experienced coach pressure to lose weight or maintain a low body weight, 49 athletes (20.5%) responded affirmatively; nine did not answer. Of the athletes who recalled past coach pressure to lose weight or maintain a low body weight, 11 (22.4%) met the disordered eating cut-off score. Two (4.1%) of the athletes who reported previous coach pressure to lose weight or maintain a low body weight were classified as underweight according to their BMI and 11 (22.4%) were overweight.

Athletes on two dance teams made up the majority of athletes who reported this perceived pressure (*n* = 18, 36.7%) along with three cross country/track teams who made up 22.4% (*n* = 11) and 20.4% (*n* = 10) of the volleyball players from two volleyball teams. Basketball, softball, swimming, lacrosse, and soccer players made up the remaining 20.4% (*n* = 10) of those athletes who recalled previous coach pressure. Interestingly, two teams had more athletes who reported past coach pressure to lose weight or maintain a low body weight than athletes who did not report such pressure. Crosstabulations revealed that Pearson's chi-square test for team and sport in the reporting of past coach pressure to lose weight or maintain a low body weight were

statistically significant (χ^2 (14) = 40.37, $p < .001$ and χ^2 (8) = 24.10, $p = .002$, respectively). Additionally, Pearson's chi-square test for sport type in the reporting of past weight-related coach pressure was significant (see Table 4.1). When teams were divided into sport types, the distribution of athletes who recalled previous coach pressure to lose weight or maintain a low body weight was fairly even for ball sport and endurance athletes (n = 18, 16.1% and n = 13, 16.0%, respectively) and higher for aesthetic athletes (n = 18, 39.1%).

Twenty-four athletes (9.8%) reported having a family member with an eating disorder, none of whom had been diagnosed themselves; three declined to answer. When asked if they had a teammate who had been diagnosed with an eating disorder, 63 (25.6%) said yes, 2 declined to answer. Twenty (40.8%) of those who reported previous coach pressure to lose weight or maintain a low body weight also reported having a teammate who had been diagnosed with an eating disorder. Athletes who reported previous weight-related coach pressure and a teammate previously diagnosed with an

Table 4.1

Recollections of Past Weight-Related Coach Pressure by Sport Type (N = 239)

	Sport Type			
Past Coach Pressure	Ball Sport	Endurance	Aesthetic	Total
No	94	68	28	190
Yes	18	13	18	49
Total	112	81	46	

Note: Pearson's χ^2 (2) = 12.13, $p = .002$

eating disorder included 11 dance/drill team members, 5 cross country/track athletes, 2 volleyball players, 1 basketball player, and 1 swimmer.

Frequency of Perceived Coach Pressure

Although a yes/no question to past coach pressure to lose weight or maintain a low body weight revealed 20.5% of the population had at least one experience of past coach pressure, the WPS-F was used to gain more information into how often athletes felt that pressure. Using a Likert-type scale, results indicated that 10.83% (n = 26) of the athletes reported feeling weight-related pressure from coaches *often.* Additionally, 3.33% (n = 8) reported *usually or always* feeling coach pressure to lose weight or maintain a low body weight. Eight participants did not provide enough information to be included in this analysis.

Dance (n = 10; 29.4%), cross country/track (n = 7, 20.6%), volleyball, and basketball (n = 5, 14.7% each) represented the majority of athletes who felt coach pressure *often*, *usually*, or *always.* Overall, gym sports represented the type of sport where athletes experienced coach pressure most often (n = 16; 47.1%) with aesthetic sports representing 32.4% (n = 11) of the athletes who felt coach pressure on a consistent basis, and endurance sports pulling in the remainder (n = 7; 20.6%).

Descriptive Statistics

Perceived Coach Pressure

Although 14.16% of the participants reported feeling coach pressure to lose weight or maintain a low body weight *often, usually,* or *always*, the majority of athletes

reported feeling that pressure *rarely* to *sometimes* (*M* = 18.65, *SD* = 5.54; item *M* = 4.66, item *SD* = 1.39; due to reverse coding, higher scores indicate less pressure). When considering sport-related weight pressure as a whole, composite WPS-F scores indicated that, in general, athletes experienced weight-related sport pressure *rarely* to *sometimes* (*M* = 98.39, *SD* = 19.76; item *M* = 4.47, item *SD* = .90; higher scores indicate less pressure). When this scale was validated in the literature, it was pared down to 16 items (Reel et al., 2010). These 16 items revealed a mean of 73.98 (*SD* = 16.61), with an item mean of 4.62 (item *SD* = 1.04).

Between 12.6 and 27.6% of the athletes reported positive responses (*often, usually,* or *always*; Reel et al., 2010; see Table 4.2) on the four coach-related weight pressure items. The item with the greatest number of positive responses was "body weight and appearance are important to my coach" at 27.6% (*n* = 68). This finding was in accordance with previous research that indicated 27.9% of participants responded positively to this item (Reel et al., 2010). When asked if their coach noticed if they gained weight, 25.2% (*n* = 62) of the athletes responded positively and 24.9% (*n* = 60) agreed that "my coach encourages athletes to drop pounds" *often, usually,* and *always*. In the study that validated this measure, 33.8% of the respondents said their coach noticed if they gained weight *often, usually,* or *always* and 18.6% reported that their coach encourages athletes to drop pounds (Reel et al., 2010). Two respondents did not provide enough information to be included in the analysis.

Table 4.2

Positive Responses on WPS-F Coach Subscale (N = 246)

Scale Item	*Often*		*Usually*		*Always*		*Total*	
	F	%	*F*	%	*f*	%	*F*	%
My coach encourages team members to maintain a below average weight	13	5.2	8	3.2	10	4	31	12.6
Body weight and appearance are important to my coach	23	9.3	14	5.6	31	12.5	68	27.6
My coach notices if I gain weight	22	8.9	14	5.6	26	10.5	62	25.2
My coach encourages athletes to drop pounds	28	11.3	10	4.0	22	8.9	60	24.9

Past coach pressure was modestly positively correlated to perceived coach pressure to lose weight or maintain a low body weight ($r = .395$, $p < .001$). This relationship indicates that athletes who have been told to lose weight or maintain a low body weight in the past perceived more weight-related coach pressure than those athletes who had not been told to lose weight or maintain a low body weight by a coach.

Cronbach's alpha for the original, 22-item WPS-F was .905 ($N = 179$, 95% CI [.884, .924]). After removing six items, as done for the validation of the scale (Reel et al., 2010), Cronbach's alpha increased to .918 (95% CI [.902, .933]). In accordance with the aims of this study, the four items related to perceived coach pressure to lose weight or maintain a low body weight were also tested. In the original development of the WPS-F, Reel et al. (2010) identified a factor that included coach and teammate pressure. For the

present study, just the coach pressure items were used in the analysis as the resulting subscale would be used to measure the effect of weight-related coach pressure alone, instead of measuring the more global pressures some athletes feel from a variety of sources, including uniforms, judging, audience, and teammates. Internal consistency for the coach pressure subscale created using these four items was identified as Cronbach's α = .89 (*N* = 241, 95% CI [.856, .905]). The assumption of normality was tested using a Kolmogorov-Smirnov test. Significant results (.212, $p < .001$) indicated the data were not normally distributed (skewness = -.978, kurtosis = -.005). Instead, the majority of athletes did not feel pressure on a consistent basis, skewing the data.

Coach-Athlete Partnerships

On average, participants reported moderately strong coach-athlete partnerships (*M* = 57.03, *SD* = 15.95; item *M* = 5.18, item *SD* = 1.45). Average commitment was slightly more than neutral, item *M* = 4.806, item *SD* = 1.59. Both closeness and complementarity were also slightly more than neutral, item *M* = 5.51, item *SD* = 1.56 and item *M* = 5.14, item *SD* = 1.45, respectively. The Likert-type scale ranged from 1 *strongly disagree* to 7 *strongly agree*, indicating that, on average, participants did not feel a strong connection to their coach, but it was positive. Kolomogorov-Smirnov test revealed the data were not normally distributed (skewness = -.969, kurtosis = .198).

The CART-Q composite score was found to be internally consistent with a Cronbach's alpha of .96 (*N* = 242, 11 items, 95% CI [.957, .971]). This statistic was slightly higher than the reliability found for the measure in its initial development (α = .93; Jowett & Ntoumanis, 2004). CART-Q subscale reliabilities ranged from .91-.94;

each subscale was composed of 3-4 items. These reliabilities were all higher than the subscale reliabilities found in the original development of the measure (α = .82-.88; Jowett & Ntoumanis, 2004).

Disordered Eating Behaviors

Previous research on disordered eating behaviors in athletes, using the EAT-26, revealed a mean score of 6.97 (*SD* = 6.99) out of a possible 46 (Doninger et al., 2005). The present sample was similar (*M* = 6.36, *SD* = 6.92; *N* = 234). The Kolmogorov-Smirnov statistic was significant (.200, $p < .001$), indicating the data were not normally distributed (skewness = 2.38, kurtosis = 7.31). Possible outliers likely contributed to the positive skewness.

According to skewness tests and visual inspection of a boxplot, a few potential outliers existed. Participants were considered clinical outliers if their EAT-26 scores were greater than 21, which corresponds with the potential clinical profile for athletes scoring greater than 20 (Doninger et al., 2005); there were 7 total potential outliers in this population. Outliers were confirmed with the use of *z* scores. All 7 participants had *z* scores greater than 3.0, ranging from 3.12 to 5.15. All participants who provided data for each item on the EAT-26 were included in the analysis as they were deemed to represent the population (Thompson & Sherman, 2010). In essence, although they were identified as potential outliers statistically, they were not identified as outliers practically. Disordered eating behaviors were positively related to reports of previous coach pressure to lose weight or maintain a low body weight ($r = .206$, $p = .002$). Finally, Cronbach's alpha for the EAT-26 with this sample was slightly lower (α = .82; *N* = 234; 26 items;

95% CI [.787, .853]) than a previous study using the collegiate athlete population (α = .90; Doninger et al., 2005).

Bivariate Correlations

This study sought to use perceived coach pressure to lose weight or maintain a low body weight and the athlete's perceptions of the coach-athlete partnership to predict disordered eating behaviors in female collegiate athletes. Simple bivariate correlations were conducted to determine that both of these factors were correlated with disordered eating behaviors before proceeding to a multiple regression analysis.

Simple bivariate correlations revealed that there was a moderate positive relationship between global weight-related sport pressure and disordered eating behaviors ($N = 175$, $r = .407$, $p < .001$), illustrating that as perceptions of weight-related sport pressure increased, so did disordered eating behaviors. Seventy-three athletes did not answer all 16 WPS-F questions. As the first aim of the study was to look at how perceived *coach* pressure is related to disordered eating behaviors, a simple bivariate correlation was run for the coach pressure-related items of the WPS-F and EAT-26 scores. Results indicated a modest positive relationship ($N = 227$, $r = .298$, $p < .001$) between the two. This finding supported the hypothesis that as perceptions of weight-related coach pressure increased, so did disordered eating behaviors. That is, the more pressure athletes felt from coaches to lose weight or maintain a low body weight, the more likely they were to engage in disordered eating behaviors.

The Pearson product-moment correlation coefficient was $r = -.244$, $p < .001$ ($N = 228$) for overall coach-athlete partnerships and disordered eating behaviors. This modest

negative relationship implies that the stronger the athletes' perceptions of the coach-athlete partnership are, the less likely they are to exhibit disordered eating behaviors. Simple bivariate correlations were then calculated for each of the CART-Q subscales and the EAT-26 composite scores. Results indicated modest negative relationships for commitment (N = 230, r = -.220, p = .001), closeness (N = 229, r = -.226, p = .001), and complementarity (N = 232, r = -.244, p < .001). The fact that correlations by CART-Q subscale to disordered eating behaviors are not statistically different from each other may be due to the high correlation between subscales, ranging from r = .809-.885 (p < .001).

Finally, simple bivariate correlations were calculated for perceived sport pressure to lose weight or maintain a low body weight and coach-athlete partnerships. When comparing global weight-related sport pressure and composite coach-athlete partnership scores, a small negative relationship was identified (N = 176, r = -.184, p = .015). These results indicated that as weight-related sport pressure perceptions increase, perceptions of the strength of the coach-athlete partnership were weaker. As stated earlier, the focus of this study was to better understand perceived *coach* pressure. Therefore, a correlation for the coach-specific items of the WPS-F and the CART-Q was calculated, indicating a modest negative relationship (N = 236, r = -.265, p < .001), such that increased perceptions of weight-related coach pressure are related to perceptions of weaker coach-athlete partnerships. All correlations for coach-athlete partnership subscales were statistically different from zero at p < .001, although correlations between weight-related coach pressure and each of the subscales were not significantly different from each other.

Regression Analysis

Based on the descriptive results and correlations, proceeding with a standard multiple regression analysis was deemed appropriate. Two hundred twenty-two cases were used in the generation of the regression equation. Seven cases were determined to be potential statistical outliers, but were included in the analysis as they were assumed to be representative of the population based on past research and case studies (Thompson & Sherman, 2010). The sample was divided into two "new" samples, constructed of 80% and 20% of the entire sample to perform cross-validation of the regression equation. An initial regression equation was created for the derivation sample ($y' = -.299x_1 + -.088x_2 + 17.015$), revealing an R^2 of .112. See Table 4.3 for b coefficients, standard error, standardized beta weights, *t* values, and significance. Linearity was confirmed by visual inspection of the scatterplot of regression residual values to predicted values. Also, the VIF for the regression equation was 1.07, indicating that multicollinearity was not a problem. The independence of errors assumption was supported with a Durbin-Watson statistic of 1.956.

Table 4.3

Regression Analysis Summary for Coach Variable Predicting Female Collegiate Athletes' Disordered Eating Behaviors (N = 178)

Scale Type	B	SE B	β	*t*	*p*
WPS-F Coach Subscale	.299	.094	.230	3.187	.002
CART-Q Composite	-.088	.033	-.192	-2.657	.009

Notes: R of .334, adjusted R^2 = .102, F (2, 182) = 11.461, $p < .001$.

Standardized beta weights indicated that the more pressure an athlete perceives from her coach to lose weight or maintain a low body weight and the weaker she perceives her relationship with her coach to be, the higher her disordered eating behaviors scores are. They also indicated that both perceived weight-related coach pressure and the coach-athlete partnership contribute fairly equally to the regression equation, indicating that both variables have a direct effect on disordered eating behavior rather than a mediating effect by the coach-athlete partnership. Practically, this implies that perceived coach pressure to lose weight or maintain a low body weight and the athletes' perceptions of the coach-athlete partnership explained 13.3% of the variance in disordered eating behaviors scores for this population. That is, perceptions of more weight-related coach pressure and weaker coach-athlete relationships predicted 13% of the differences in disordered eating behaviors; however, that leaves 87% of the difference in disordered eating behaviors unaccounted for by the variables in this study.

Cross-Validation

To assess generalizability of the regression equation calculated with 80% of the sample (n = 178), the regression equation, $y^1 = .299x_1 + -.088x_2 + 17.015$, was then applied to the remaining 20% (n = 44) of the sample. Once a predicted value was calculated for each value, a simple bivariate correlation was employed to calculate the correlation between the predicted values for disordered eating behaviors and the actual scores reported by participants. This bivariate correlation revealed a correlation coefficient of r = .372 (p = .024), which resulted in an R^2 of .138. This new R-value is

slightly higher than the original (adjusted R^2 = .102). Regardless, the direction of the relationship remained constant, indicating that the generalizability assumption was met.

Regression by Sport Type

Although nine sports were represented in this study, some had relatively few athletes; therefore, sports were collapsed into sport types. Specifically, sports were classified by the four-class system outlined in Dosil (2008) including aesthetic sports, gym sports (referred to here as ball sports), endurance sports, and weight-dependent sports. Because weight-dependent sports include sports such as body building, wrestling, or crew and the present sample did not have athletes from any of those sports, the weight-dependent classification was not included in the analysis.

ANOVA revealed that perceived weight-related coach pressure (F (2, 238) = 12.580, $p < .001$) and coach-athlete partnerships (F (2, 239) = 19.045, $p < .001$) differed significantly by sport type; disordered eating behaviors did not differ by sport type (F (2, 231) = 2.721, $p = .068$). Therefore, regression equations by sport type were also calculated to determine if the regression equation differed by sport type.

Levene's statistic by sport type was significant for perceived coach pressure (3.409, $p = .035$) and coach-athlete partnerships (14.437, $p < .001$), indicating that both violated the assumption of homogeneity; disordered eating behavior by sport type did not violate the assumption of homogeneity (Levene's statistic = 1.958, $p = .143$). Because Levene's statistics indicated that variances were not equal by sport type and ANOVA revealed that weight-related coach pressure and coach-athlete partnerships differed by sport type, Games-Howell post hoc tests were used for these two variables. This test

showed significant differences in perceived coach pressure to lose weight or maintain a low body weight between aesthetic and ball sports (*M* difference = 3.46, *SD* = 0.95, *p* = .001) and aesthetic sports and endurance sports (*M* difference = 4.97, *SD* = 0.94, *p* < .001). That is, these results indicated that athletes in aesthetic sports perceive more coach pressure to lose weight or maintain a low body weight than ball sports or endurance sports athletes. Games-Howell post hoc also revealed significant differences in the strength of the coach-athlete partnership between endurance sports and aesthetic sports (*M* difference = 10.62, *SD* = 2.79, *p* = .001) and between endurance sports and ball sports (*M* difference = 12.96, *SD* = 1.91, *p* < .001). Therefore, on average, athletes in endurance sports reported stronger coach-athlete partnerships than athletes in either aesthetic or ball sports. Because ANOVA did not reveal differences in disordered eating behaviors by sport type, a Tukey's HSD post hoc was not performed.

To obtain differences in predictability of perceived weight-related coach pressure and coach-athlete partnerships by sport type, the sample was divided into three "new" samples, constructed of endurance sport athletes, aesthetic sport athletes, and ball sport athletes. For endurance sport athletes, regression analysis revealed an R^2 of .277. These results indicated that coach-athlete partnerships and perceived coach pressure to lose weight or maintain a low body weight predict 27.7% of the variance in disordered eating behaviors in endurance sports (see Table 4.4). VIF for the equation was 1.08, indicating that multicollinearity was not a problem and the Durbin-Watson statistic was 1.977, indicating that the independence of errors assumption was met.

Table 4.4

Regression Analysis Summary for Coach Variable Predicting Female Collegiate Endurance Athletes' Disordered Eating Behaviors (N = 80)

Scale Type	B	SE B	β	*t*	*p*
WPS-F Coach Subscale	.509	.138	.374	3.701	< .001
CART-Q Composite	-.183	.066	-.279	-2.767	.007

Notes: R = .526, adjusted R^2 = .258, F (2, 77) = 14.744, p < .001

For aesthetic sport athletes, regression analysis revealed an R^2 of .171. Multicollinearity was not a problem (VIF = 1.453) and errors were found to be independent (Durbin-Watson = 1.480). See Table 4.5 for b coefficients, standard error, beta weights, *t* scores, and significance. The regression analysis revealed that weight-related coach pressure accounted for 17% of the variance in disordered eating scores; the coach-athlete partnership did not contribute significantly to this variance.

For ball sport athletes, regression analysis found an R^2 of .020. Although these findings were not statistically significant, see Table 4.6 for b coefficients, standard error,

Table 4.5

Regression Analysis Summary for Coach Variable Predicting Female Collegiate Aesthetic Athletes' Disordered Eating Behaviors (N = 38)

Scale Type	B	SE B	β	*t*	*p*
WPS-F Coach Subscale	.761	.301	.469	2.527	.016
CART-Q Composite	.056	.086	.119	.644	.524

Notes: R = .414, adjusted R^2 = .124, F (2, 35) = 3.621, p = .037.

Table 4.6

Regression Analysis Summary for Coach Variable Predicting Female Collegiate Ball Sport Athletes' Disordered Eating Behaviors (N = 104)

Scale Type	B	SE B	β	*t*	*p*
WPS-F Coach Subscale	.093	.118	.374	-.783	.435
CART-Q Composite	-.070	.039	-.176	1.801	.075

Notes: $R = .196$, adjusted $R^2 = .020$, $F(2, 101) = 2.024$, $p = .137$.

beta weights, *t* values, and significance. The regression analysis for ball sport athletes indicated that neither perceived coach pressure to lose weight or maintain a low body weight nor the coach-athlete partnership predicted disordered eating behaviors in the sample.

Several things should be noted regarding these findings. The first is that sport type may be a moderating variable. The second is that, for aesthetic sports athletes, the coach-athlete partnership was not a predictor of disordered eating behaviors ($p = .524$). Finally, for ball sport athletes, neither coach-athlete partnerships nor perceived coach pressure to lose weight or maintain a low body weight were statistically significant predictors of disordered eating behaviors.

Mediational Analysis

The second aim of this study was to determine what role the coach-athlete partnership plays in the relationship between perceived weight-related coach pressure and disordered eating behaviors in female collegiate athletes. Therefore, several mediational

analyses were conducted for this study. The reasons for each analysis and the results will be presented below. The general mediation model is presented in Figure 4.1.

For this study, ANOVA was used to obtain b coefficients and standard errors of b (both necessary statistics to calculate the Sobel statistic) as it allowed the researcher to account for nested effects. Although the Sobel statistic could have been calculated using b coeffecients and standard errors of b calculated from regression (as seen in Table 4.3), accounting for nesting effects of both sport type and school could also be calculated using ANOVA.

First, as the present study sought to identify the role of the coach-athlete partnership on the relationship between perceived coach pressure to lose weight or maintain a low body weight and disordered eating behaviors, assuming that individual scores on the WPS-F and the CART-Q would be a first-level predictor and team would be a second-level predictor—because athletes from each team would share a coach and the coach would vary between teams—the initial hierarchical linear model reflected this assumption. As a first step, the intercept for disordered eating behaviors was calculated,

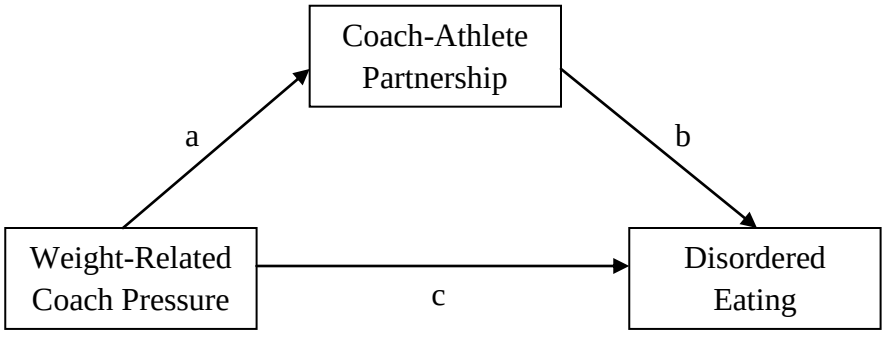


Figure 4.1. Mediating role of coach-athlete partnerships in explaining the relationship between weight-related coach pressure and disordered eating behaviors in female collegiate athletes.

providing a grand mean for those behaviors. The resulting *t* value ($t = 14.043$, $p < .001$) served as the grand mean of disordered eating behaviors for the entire sample.

A mixed model analysis was then run to determine if team was a nesting variable. When team number was entered into the model as a fixed effect, the intercept remained significant (F (1, 232) = 50.097, $p < .001$); however, team was not a statistically significant nesting variable (F (1, 232) = .250, $p = .618$; $N = 232$). This is likely due to unequal cell sizes for 15 teams (e.g., one volleyball team only had 7 team members in attendance, whereas one track/cross country team had 30 members). Given these unequal cell sizes, an ANOVA could not be run for many groups, impeding the ability to truly explore team as a nesting factor. Therefore, the analysis was stopped and other nesting variables were explored.

Given differences in regression analyses by sport type, sport type was then explored as a nesting variable. When comparing the average EAT-26 scores without accounting for sport type ($M = 6.259$) to the average disordered eating scores when accounting for sport type ($M = 9.361$), a significant difference was observed. With sport type entered as a fixed effect, the intercept was significant (F (1, 232) = 47.345, $p < .001$). A significant Wald Z (5.385, $p < .001$) indicated that sport type variance was statistically different from zero. This meant it was a nesting factor and should be considered in the analysis.

Because team (the predicted Level 2 variable) was not significant, Level 2 had to be removed from the equation and testing the model with school as the Level 3 variable proceeded. School was explored as a Level 3 nesting variable due to differences in

geographic location, socioeconomic status, level of competition, and educational focus. At that point, school and sport type were entered into the general linear model as fixed factors. Neither sport type (F (2, 232) = .791, p = .524) nor school (F (3, 232) = .434, p = .747) showed significant main effect; however, the interaction between the two was significant (F (3, 232) = 3.177, p = .025). These results indicated that sport type had an effect on disordered eating behavior as a function of school. Because of the discrepancy of cell sizes (see Table 4.7), this interaction could be somewhat ambiguous. Therefore, two possible mediation models were created.

The first model investigated the role of the coach-athlete partnership, determining whether it mediated the relationship between perceived weight-related coach pressure and disordered eating, without accounting for the interaction between sport type and school. This first model did still account for school as a nesting factor (because it was a Level 3 variable), but did not include sport type as a fixed factor. The second model investigated

Table 4.7

Number of Participants Representing Each Sport Type at Four Universities (N = 248)

	School				
Sport Type	1	2	3	4	Total
Aesthetic Sport	29		18		47
Ball Sport	23	38	7	48	116
Endurance Sport	43	30	12		85
Total	95	68	37	48	

the role of the coach-athlete partnership on the relationship between perceived coach pressure to lose weight or maintain a low body weight and disordered eating while accounting for the interaction between sport type and school.

As a first step in creating the first mediational model, b coefficients for each of the variables were calculated. First, a simple bivariate correlation between perceived weight-related coach pressure and the coach-athlete partnership was obtained (r = -.265, r < .001). An ANOVA using the coach-athlete relationship as the dependent variable, school as the fixed factor, and weight-related coach pressure as the covariate (F (1, 234) = 17.639, r < .001) was performed. Covariate parameters for this relationship were reviewed; the b coefficient for this relationship was .764 (SE = .182, p < .001). A second ANOVA was then calculated to observe the relationship between coach-athlete relationship and disordered eating behaviors when perceived weight-related coach pressure was in effect (r = -.244, p < .001; F (1, 226) = 14.312, p < .001). The b coefficient for this relationship was -.106 (SE = .028, p < .001). See Figure 4.2 for a visual representation of the covariance parameters.

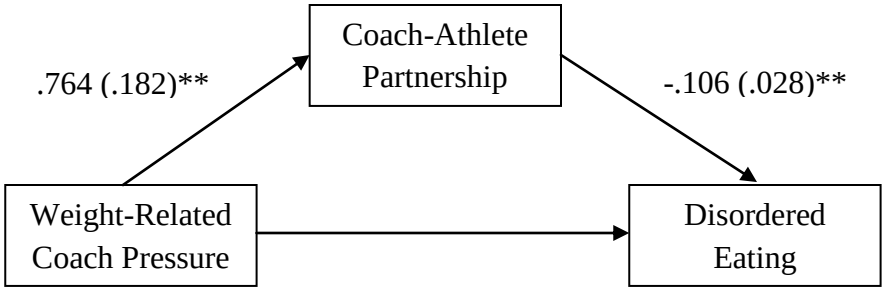


Figure 4.2. Mediating role of coach-athlete partnerships in explaining the relationship between weight-related coach pressure and disordered eating behaviors in female collegiate athletes where school is a nesting variable. ** *p < .001*

B coefficients and standard errors for the relationship between perceived weight-related coach pressure and coach-athlete partnership and between the coach-athlete partnership and disordered eating behaviors when weight-related coach pressure was in effect (as calculated above) were then entered into a Sobel test formula (see Formula 1; as cited in Preacher, 2010). A significant Sobel statistic indicates the presence of a mediating variable by using the parameter estimates from multilevel modeling to obtain a *z* score (Preacher, 2010).

Formula 1: $$z = \frac{a * b}{\sqrt{(b^2 * s_a + a^2 * s_b)}}$$

Due to the exploratory nature of the present study and the inability to predict how the coach-athlete partnership may mediate the relationship between perceived weight-related coach pressure and disordered eating behaviors (if it was found to be a mediator), a second hypothesis was not initially offered. However, for this model, the Sobel statistic was $z = -2.811$ ($SE = .029$, $p = .004$), indicating that the coach-athlete partnership was a mediating variable between perceived coach pressure to lose weight or maintain a low body weight and disordered eating behaviors when sport type and school were not accounted for. The same values were observed when using b coefficients and standard error values obtained from a simple regression analysis.

Although the previous model was deemed appropriate for this study given the unequal cell sizes for sport type and school (refer to Table 4.4), a model using sport type as a nesting variable and school as a Level 3 variable was also conducted. To accomplish this task, the above procedures were completed, with the addition of school and sport

type entered as a fixed factors in the general linear model. In this model, the b coefficient for perceived weight-related coach pressure and coach-athlete partnership was .347 (*SE* = .166, *p* = .037) and .080 (*SE* = .035, *p* = .023) for coach-athlete relationships and disordered eating behaviors. A visual representation of the covariance parameters is available in Figure 4.3.

The Sobel statistic for this model was *z* = -1.543 (*SE* = .018, *p* = .123). The non-significant Sobel score indicated that, when sport type was included in the model, coach-athlete partnerships did not mediate the relationship between perceived coach pressure to lose weight or maintain a low body weight and disordered eating behaviors.

The difference between the models, such that the coach-athlete partnership was a mediating variable when sport type was not accounted for and was not a mediating variable when it was, may indicate that the coach athlete partnership is a partial mediating variable. The finding from regression analysis that the coach-athlete partnership had a direct effect on disordered eating behaviors in female collegiate athletes lends support to this supposition. The difference between the two models also lends

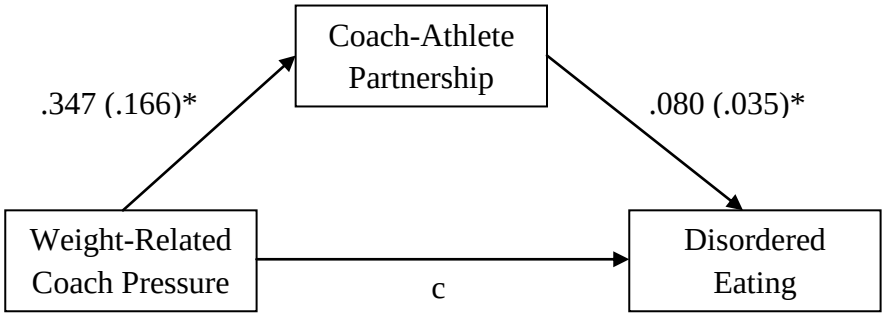


Figure 4.3. Mediating role of coach-athlete partnerships in explaining the relationship between weight-related coach pressure and disordered eating behaviors in female collegiate athletes. * $p < .05$

support to the speculation that sport type is a moderating variable.

Discussion

Given the alarming number of athletes engaging in potentially harmful disordered eating behaviors, understanding the contributing factors of those behaviors was deemed necessary. Therefore, the goal of this study was to investigate the role of the coach in the development or exacerbation of disordered eating behaviors.

The present study showed that as many as 4.29% of the participants are at risk for eating disorders, as indicated by EAT-26 scores greater than 20. Although this is nearly double the number of athletes who have clinical eating disorders in a previous sample, measurement issues may be to blame. For instance, Greenleaf et al. (2009) found that 2.5% of their female collegiate athlete population had clinical eating disorders. However, they used more sensitive measures such as the Questionnaire for Eating Disorder Diagnoses (Q-EDD) and Bulimia Test-Revised (BULIT-R) instead of the EAT-26 to measure eating disordered behavior. On the other hand, when the EAT-26 was validated for use with the female collegiate athlete population, athletes scoring greater than 20 represented 6% of the sample (Doninger et al., 2005). From this perspective, there were actually fewer athletes in the present study who may have a clinical eating disorder. Regardless of measurement complications, 2.0% of the present sample reported being previously diagnosed with an eating disorder, which is in line with the findings of Greenleaf and colleagues (2009).

At present, research indicates that disordered eating behaviors affect between 20 and 60% of the female collegiate athlete population (Cogan, 2004; Sanford-Martens et

al., 2005). The present sample was lower than previous findings with a reported disordered eating behavior prevalence of 9%. In a recent study, Doninger and colleagues (2005) found that the mean disordered eating score, as measured by the EAT-26, was 6.97 (*SD* = 6.99) for collegiate athletes. The present study yielded similar results with a mean of 6.36 (*SD* = 6.92). This lends credibility to the generalizability of these results to other female collegiate athletes.

It should also be noted that these behaviors likely occur more often than we know. Underreporting has been cited as a problem in the field of disordered eating behaviors in athletes (e.g., Beals, 2004). It may also have been at play in the present study. That is, when asked if the participant had a teammate who had been diagnosed with an eating disorder, 25.4% answered affirmatively. However, only five (2%) of the participants admitted to having been diagnosed with an eating disorder in the past. This discrepancy could be explained by a number of reasons, including that the teammate was no longer on the team or that the participant was suspected of an eating disorder, but a diagnosis had not been confirmed. This may also be circumstantial evidence of social desirability responding that may have occurred with this study. Some athletes may have been willing to acknowledge teammates with suspected eating disorders but did not want to admit that they, themselves, might have a problem.

Additionally, Williams et al. (2003) found that athletes who recalled weight-related pressure from others were 2.8 times more likely to engage in disordered eating behavior and Muscat and Long (2008) found that nearly half of their participants believed direct weight-related coach comments had a significant impact on their attitudes and

behaviors toward their bodies, more so if those comments were perceived as threatening or severe. Forty-nine of the participants in this study recalled previous weight-related comments from their coaches and 24% of those athletes who recalled previous weight-related coach comments reported engaging in disordered eating behaviors. Although the present study did not ask what impact those comments had on athletes' eating behaviors directly, the intensity of those experiences seemed to vary. One volleyball player recalled, "My junior college coach told me I'd have a better chance of being recruited if I was thinner." A track athlete explained that during her "freshman year we had to get our percent body fat tested and we had to be an exact percent (16%)." A dancer claimed that, "She told me to loose [sic] weight and if I didn't I'd be taken off [the] team." And an endurance runner saw it as related primarily to performance, saying "Being a long distance runner you need to be very lean and fit so their [sic] would be suggestions to get leaner or discussions about what I was eating and to watch it." Based on these responses, it seems that although quite a few athletes have experienced coach pressure to lose weight or maintain a low body weight during their athletic careers, the reason for that pressure and the athlete's appraisal of that pressure varies greatly. In fact, some athletes thought it was a good thing, explaining that the coach "want[ed] [athletes] to lose weight, but in a good way." For other athletes, it was a negative experience with few reasons as to why they should lose weight. As one dancer explained, she felt pressure "by comments that have been made by [the coach], about the way I look."

Researchers (e.g., Williams et al., 2003) indicated that previous weight-related comments are related to disordered eating behaviors, but studies comparing differences in

how those comments affect athletes from different sports in the same study are still fairly sparse. Because sport type was a potential moderating variable in the current study, it was deemed important to compare previous coach pressure and disordered eating behaviors by sport. For instance, only 15% of endurance and ball sport athletes experienced previous weight-related coach pressure whereas nearly 40% of athletes in aesthetic sports recalled coach pressure to lose weight or maintain a low body weight.

A number of factors have been identified as contributing to the acquisition and use of these detrimental behaviors (e.g., Thompson & Sherman, 2010). Included in this list is the role of the coach as a contributing factor (e.g., Dosil & Gonzalez-Oya, 2008). As a result, the first aim of this study was to identify the relationship between weight-related coach pressure and disordered eating behaviors in athletes. The modest correlations between perceived coach pressure to lose weight or maintain a low body weight and disordered eating behaviors ($r = .298$, $p < .001$) and between the coach-athlete partnership and disordered eating behaviors ($r = -.244$, $p < .001$) support this assertion and previous research on weight-related coach pressure and eating disorders in cheerleaders (Reel & Gill, 1996).

Moreover, the moderately positive correlation between reports of past coach pressure to lose weight or maintain a low body weight and frequency of perceived weight-related coach pressures ($r = .395$, $p < .001$) indicates that athletes who have experienced that pressure in the past are more sensitive to possible pressures now. Perhaps those who have felt pressure in the past are more sensitive to indirect coach pressure, more in tune with various comments or gestures that might imply coach

pressure even though that may not be the intent of the coach. Conversely, perhaps those pressures are present but are ignored by athletes who have not experienced previous pressure to lose weight or maintain a low body weight. As such, reports of past coach pressure may have been a confounding variable in this study. Although there is not currently an empirical link between the past coach pressure to lose weight or maintain a low body weight and current perceived coach weight-related coach pressure in the literature, future research should investigate this relationship.

As sport type was identified as a potential moderating factor, it was also important to identify how often athletes perceive weight-related coach pressure by sport type. When measuring the frequency of perceived weight-related coach pressure, ball sports composed the greatest percentage of athletes who felt coach pressure most often, accounting for 47.1% of the positive responses. That is, of athletes who felt pressure on a consistent basis, ball sport athletes accounted for 47.1% of the sample. However, when the percentage of athletes in each sport type who feel weight-related coach pressure on a consistent basis are compared to the total number of athletes from that sport, 14% of all ball sport athletes perceive weight-related coach pressure compared to the 25% of aesthetic athletes and 9% of endurance athletes. Consequently, more aesthetic athletes feel weight-related pressure from their coaches than ball sport athletes or endurance athletes. Hence, athletes from all sports reported consistently feeling pressure to lose weight or maintain a low body weight from their coaches, but athletes in aesthetic sports are especially susceptible to those perceptions. And given that increases in weight-related coach pressure are related to increases in disordered eating behaviors, may then be

more susceptible to disordered eating behaviors than other sport types. This refutes a recent study that athletes in nonlean sports exhibit more disordered eating behaviors than athletes in lean sports (Milligan & Pritchard, 2006).

Furthermore, as coach-athlete partnerships did not seem to predict disordered eating behaviors in aesthetic sport athletes, a separate regression analysis using perceived weight-related coach pressure as the only predictor suggest that perceived weight-related coach pressure predicts 15.6% of the variance in disordered eating behaviors for these athletes (R = .422; R^2 = .178; adjusted R^2 = .156; $F\ (1, 37)$ = 8.061, p = .007). Again, this indicates that perceptions of weight-related coach pressure are especially salient predictors of disordered eating behaviors in aesthetic athletes.

The second aim of the study was to investigate the role of the coach-athlete partnership on the relationship between perceived weight-related coach pressure and disordered eating behaviors. That is, did the coach-athlete partnership have a direct effect on disordered eating behaviors or a mediating effect on the relationship between weight-related coach pressure and disordered eating behaviors?

Research on the coach-athlete partnership has suggested that the coach-athlete relationship is affected by several antecedents and subsequently has an impact on various outcomes (Poczwardowski & Jowett, 2007). To this point, the suggested model remains largely theoretical, but researchers in the field have sought to investigate various relational outcomes of the coach-athlete partnership (e.g., conflict and satisfaction within the partnership, Jowett, 2009) and one investigated self-concept (Jowett & Cramer, 2010). As researchers in the field have suggested that the coach-athlete relationship may

be related to health-related outcomes such as eating disorders (Jowett & Poczwardowski, 2007), it was deemed an appropriate variable for study.

Jowett and Cramer (2010) found that coach-athlete partnerships accounted for 25% of the variance in youth athletes' perceptions of their bodies. Regression analyses by sport type confirmed this finding, indicating that the coach-athlete partnership has a direct effect on disordered eating behaviors. Overall regression analysis revealed that perceived weight-related coach pressure and coach-athlete partnerships predicted disordered eating behaviors in female collegiate athletes (13%). Interestingly, further analysis revealed that these variables may be greater contributors to endurance athletes' disordered eating behaviors (25%) than the other two types of athletes. In fact, the coach-athlete partnership did not predict disordered eating behaviors in either aesthetic athletes or ball sport athletes. The difference in predictability of weight-related coach pressure and perceptions of the coach-athlete partnership on disordered eating behaviors by sport type may be due to the many other factors that can contribute to disordered eating behaviors in the athletic population, as discussed in Chapter 2.

To investigate the possible mediating role of the coach-athlete partnership, a mediational analysis with ANOVA and Sobel test statistics was utilized. Two models were proposed due to limitations in the data, resulting in two perspectives on the role of the coach-athlete partnership in the relationship between weight-related coach pressure and disordered eating behaviors. When sport type was not accounted for in the analysis (due to unequal cell sizes by school), the coach-athlete partnership was found to be a mediating factor. However, when sport type was accounted for in the model, the coach-

athlete partnership was not found to be a mediating factor. Because sport type was found to be a nesting variable, it should be entered into the model. However, because several schools were missing certain sport types, the complete model could not be analyzed. Future research should investigate this finding further, paying special attention to equal cell sizes for sport type by school.

Additionally, if the coach-athlete partnership was a mediating variable, the percent variance explained by perceived weight-related coach pressure should have decreased when the coach-athlete partnership was entered into the regression equation. Because that did not occur—instead the coach-athlete partnership had a direct effect on disordered eating behaviors in athletes—and the first mediational model did indicate that the coach-athlete partnership was a mediating variable until sport type was accounted for, it could be that the coach-athlete partnership is a partial mediating variable.

The possible partial mediating effect of the coach-athlete partnership, thus, lends support to the conceptual framework forwarded by Jowett and Poczwardowski (2007). The present study supported the idea that antecedent variables, such as overconformity to the sport ethic, influence communication, such as perceived weight-related coach pressure, which then influences the coach-athlete partnership and thus health-related outcomes, such as disordered eating behaviors. Although the link between the communication portion to the coach-athlete partnership and then to disordered eating behaviors was partially supported, the full mediational model should be tested to support these findings. Additionally, although overconformity to the sport ethic was theorized to act as an antecedent to the rest of the conceptual framework, it was not directly measured

in the present study. Therefore, future research should empirically measure the role of overconformity to the sport ethic.

Even though the goal of this study was to investigate the potential contributing role of the coach on disordered eating behaviors in female collegiate athletes, it is important not to lose sight of the big picture. For example, Reel and colleagues (2010) found that athletes feel weight-related pressure from a variety of sources. The present study, then, supports the assumption that more weight-related pressure is related to more disordered eating behaviors, regardless of the source. When investigating the relationship between the broader sport-related pressure to lose weight or maintain a low body weight, the moderate correlation ($r = .407$, $p < .001$) indicated that the more pressure athletes feel, whether based on uniform concerns, pressure from teammates, or general sport demands, the more likely disordered eating behaviors are present. These findings suggest that overconformity to the sport ethic may be at play.

It may be that perceptions of weight-related coach pressure and the coach-athlete partnership operate differently by sport type. This speculation was not tested in the present study, but the fact that athletes' explanations of coach pressure were more performance-related for endurance athletes and appearance-related for aesthetic athletes suggests that future research should investigate how athletes perceive pressure and whether those perceptions are positive or negative. It may be that athletes who perceive weight-related coach pressure as a neutral or positive thing may be less likely to exhibit disordered eating behaviors than athletes who perceive that pressure as a negative thing, but more research is required to understand this possibility.

This is a good reminder that many things contribute to disordered eating behavior, including the sport in general, personality characteristics, teammates, judges, coaches, family, media, and more. Finding that the coach accounts approximately 13% of the variance in disordered eating behaviors in female collegiate athletes is significant, but there is another 87% not accounted for in this study. As a result, researchers and practitioners, alike, should use the information from this study to address coach-related issues with their athletes but should also keep an open mind to all of the other contributing factors that may be present in the athlete's life.

CHAPTER 5

SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS FOR FUTURE RESEARCH

Summary

The purpose of this study was to understand the nature of the relationship between perceived weight-related coach pressure and disordered eating in female collegiate athletes and to explore the coach-athlete partnership as a possible mediating variable. It was hypothesized that perceptions of weight-related coach pressure would be related to disordered eating behaviors and that the coach-athlete partnership would have a role in those behaviors. Female collegiate athletes (N = 248) from four universities completed questionnaire packets to provide information about their experiences with weight-related coach pressure, the coach-athlete partnership, and eating attitudes and behaviors.

Findings

Simple bivariate correlations, regression analyses, and mediational analyses were performed to accomplish the aims of this study. Significant findings are discussed below.

1. The present study indicated that 13.30% of the athletes exhibit disordered eating behaviors. Included in that percent are 4.29% who met the cut-off score for potentially clinically significant issues. This is slightly lower than previous research

(e.g., Doninger et al., 2005; Sanford-Martens et al., 2005), but measurement differences may be to blame.

2. The mean disordered eating score (M = 6.36, SD = 6.92), as measured by the EAT-26, was consistent with previous results using the same instrument with college athletes (Doninger et al., 2005). Coach-athlete relationships were slightly weaker (item M = 4.38-5.78, SD = 1.47-1.84) than previous research with a somewhat similar sample (Jowett & Ntoumanis, 2004) and, on average, athletes perceived weight-related coach pressure rarely to sometimes.

3. Several predictors of disordered eating behaviors have been identified in previous research including: (a) sociocultural factors, (b) pressures unique to sport, (c) exercise and physical activity influences, and (d) intra-individual factors (Hausenblas & Carron, 1999). The present study sought to investigate sociocultural factors, such as the coach-athlete partnership and pressures unique to sport. Findings supported previous research on sociocultural factors and found that pressures unique to sport, such as uniform pressures and perceived weight-related coach pressure, were present in this sample.

4. Muscat and Long (2008) found that nearly half of their participants believed direct weight-related coach comments had a significant impact on their attitudes and behaviors toward their bodies. The present study supported previous research, finding that 22.2% of the athletes who reported direct weight-related coach pressure met the cut-off score for disordered eating behaviors.

5. Guthrie (1991) identified five factors contributing to eating disorders in female athletes directly related to the coach. Many of these factors were articulated by the present sample including: (a) "pressure caused by comments said about myself or teammates to lose excess weight," (b) "by weighing us every other week along with our Body Mass Index, and informing us to be at certain points & weights," (c) "the coach never said 'loose [sic] weight' but she did say if you don't look good in your uniform you won't perform," (d) "comments on 'ideal' body type," and (e) "she told me I needed to loose [sic] weight and if I didn't I'd be taken off team."

6. Previous research has indicated that the coach is a contributing factor in the development and exacerbation of disordered eating behaviors (e.g., Dosil & Gonzalez-Oya, 2008). The present study found that athletes who perceive more weight-related coach pressure exhibit more disordered eating behaviors. This supports the theoretical assertion that these athletes may be "uncritically accepting" recommendations from their coaches to lose weight or maintain a low body weight in order to improve performance. Thus, these athletes are likely overconforming to the sport ethic. Future research is required to confirm or refute this speculation.

7. Previous research has suggested that the coach-athlete relationship influences health-related outcomes of both coaches and athletes, such as eating disorders (Jowett & Poczwardowski, 2007). As such health-related outcomes have yet to be studied in the published literature, the finding that perceived weight-related coach pressure and the coach-athlete relationship predicted approximately 10% of the variance in disordered eating behaviors in female collegiate athletes is a good first step. This supports the

conceptual model that (a) antecedent variables, such as the sport ethic, influence communication patterns—such as perceived weight-related coach pressure, (b) which then influences perceptions of the coach-athlete partnership—as evidenced by the finding that perceptions of more weight-related coach pressure are related to weaker coach-athlete partnerships, and (c) those partnerships are then related to negative health consequences, such as disordered eating behaviors—a finding that was supported by the regression analysis that found the coach-athlete partnership, along with perceived weight-related coach pressure, predicted approximately 11% of the variance of disordered eating behaviors in female collegiate athletes.

8. Additionally, the study sought to identify the role the coach-athlete partnership plays in the relationship between perceived coach pressure to lose weight or maintain a low body weight and disordered eating behaviors. Results from a mediational analysis revealed that the coach-athlete partnership partially mediates the relationship between perceived weight-related coach pressure and disordered eating behaviors. However, even though an interaction effect between sport type and school was discovered, due to limitations in the data collected, the full model was not able to be tested. Future research should test this model with sport type and school included as fixed variables.

9. Although the aim of the study was not to test the role of sport type on disordered eating behaviors, coach-athlete relationships, and perceived weight-related pressure, results indicated that it was a moderating variable. However, unequal cell sizes by sport type may have biased this finding. As previous research on the influence of

sport type on disordered eating behaviors has yielded mixed results (e.g., Thompson & Sherman, 2010), future research should be conducted to test the influence of sport type on other samples.

Conclusion

Although the full scope of disordered eating behaviors may never be fully understood due to the sheer number of contributing factors and individual nature of these disorders, hopefully this study will aid in making coaches, researchers, and practitioners aware of the influence coaches have on the eating behaviors of their athletes.

1. Athletes are exhibiting disordered eating behaviors similar to those recorded in previous research.

2. Coach pressure is a contributing factor to disordered eating behaviors in female collegiate athletes. As athletes' perceptions of weight-related coach pressure increase, so do disordered eating behaviors. Although athletes from all sports reported feeling pressure from their coaches to lose weight or maintain a low body weight, it seems that the frequency they experience that pressure and their appraisals of that pressure may vary by sport type.

3. The coach-athlete partnership partially mediated the relationship between perceived coach pressure to lose weight or maintain a low body weight and disordered eating behaviors in female collegiate athletes. Regression analysis revealed that the coach-athlete partnership had a direct effect on disordered eating behaviors in athletes, but a hierarchical linear model revealed that the coach-athlete partnership had a mediating effect when not accounting for sport type.

Practical Implications

Findings from this study have several practical implications for coaches, practitioners, and athletes. Implications may range from coach education programs, prevention programs, individual consultations, and more.

Based on the results of this study, several implications for coaches exist.

1. The first is that coaches should understand that a quarter of female college athletes perceive weight-related pressure from their coaches on a consistent basis. Given the finding that this pressure is positively related to disordered eating behaviors, coaches should be cognizant of the fact that many of their athletes feel weight-related coach pressure that may place them at risk for the development or exacerbation of disordered eating behaviors. Coach education based on these findings may serve to create coaches knowledgeable in understanding how they can contribute to the disordered eating behaviors of athletes.

2. Second, although a cause-and-effect relationship cannot be identified with this study, it did suggest that the relationship between pressure and eating behaviors is partially mediated by coach-athlete partnerships. This may be especially important for endurance coaches, where the direct effect of the coach-athlete partnership was the strongest. That is, endurance coaches may have the added complication that not only is the coach-athlete partnership a partial mediating factor on the relationship between perceptions of weight-related coach pressure and disordered eating behaviors, but those same partnerships may have their own impact on disordered eating behaviors.

3. Finally, the relationship between past coach comments to lose weight or maintain a low body weight and current weight-related coach pressure suggests that coaches should be aware of the potential lasting effects of a weight-related comment. If coaches can be knowledgeable of these findings, perhaps they can do their part to not exacerbate the problem.

Additionally, although this study was conducted with practical implications for coach education in mind, it may not be a feasible intervention for all sports, especially if the sport ethic is at play. Therefore, an alternative application of this study would be for practitioners to use the data collected here to address athletes' concerns individually. That is, because many athletes believe, as their coaches do, that lower body weight will improve performance, they may see performance decrements as a problem of body weight. If practitioners can reduce the severity of these decrements through other performance-enhancing consultations, athletes may be less likely to blame body weight for performance issues. If practitioners can talk to their clients about the perceptions their clients are having, and why they have formed those perceptions, they may help athletes to manage negative perceptions, preventing negative health behaviors like disordered eating and eating disorders.

a. As seen in previous research (Wrisberg, 1996), athletes may believe that performance decrements are related to failure to lose weight as recommended by their coach when, in fact, a number of other factors may be to blame. Therefore, interventions with athletes to enhance performance overall (e.g., arousal regulation, imagery,

concentration training) may be beneficial in reducing drastic performance decrements that may lead athletes to blame failure to lose weight or maintain a low body weight.

b. Also, as this study suggests, overconformity to the sport ethic may be a problem and as overconformity may include other behaviors such as use of performance enhancing drugs, overtraining, and poor injury management, so practitioners should look for other signs of overconformity and discuss the consequences of such behaviors with their athletes.

c. Finally, the practitioner may assist athletes engaging in disordered eating behaviors by discussing the risks associated with those behaviors and exploring the opinions athletes hold about weight and performance as those opinions may have an influence on how the athlete perceives weight-related coach pressure. That is, some athletes in this study recalled weight-related coach pressure, but identified it as a neutral experience. One athlete claimed, "Being a long distance runner you need to be very lean and fit so their [sic] would be suggestions to get leaner or discussions about what I'm eating and to watch it." This athlete, in particular, exhibited fewer disordered eating behaviors than the mean of the sample, possibly indicating that perceptions of coach pressure were not negatively influencing her eating behaviors. Another indicated that she did experience previous coach pressure to lose weight or maintain a low body weight, "but in a good way." By talking with at-risk athletes about their perceptions and exploring the origins of those perceptions, practitioners may be able to assist the athlete in handling pressure to lose weight or maintain a low body weight without resorting to disordered eating behaviors and without recruiting the coach to do so.

Recommendations for Future Research

Findings from this study indicate that the influence of the coach on disordered eating behaviors in female collegiate athletes is significant and deserves further attention. Given the exploratory nature of this study, future research directions are numerous. Some of those suggestions are mentioned below.

1. This study was based on the premise that overconformity to the sport ethic and beliefs by the athlete and the coach that lower weight improves performance lead athletes to adopt disordered eating patterns. Although some research suggests that, to a point, weight loss improves performance in certain sports, more research should be done to investigate the link between low body weight and performance. Future research should also investigate how beliefs about weight and performance affect perceptions of coach pressure.

2. More research should be conducted to confirm the finding that more weight-related coach pressure perceptions are related to more disordered eating behaviors. As disordered eating behaviors are not confined to female collegiate athletes, research on other samples, such as youth athletes and elite athletes, would be beneficial to the present literature.

3. The mediational model indicated that the coach-athlete partnership partially mediates the relationship between perceived weight-related coach pressure and disordered eating behaviors in female collegiate athletes. Due to limitations in the data, future research should test this model with equal numbers of athletes in each sport type for each category of a nesting variable, such as school or sport. Given the theoretical

implications of the coach-athlete partnership (Jowett & Poczwardowski, 2007) and the practical implications from this study, testing the entire mediational model would be appropriate.

4. Meta-analyses (e.g., Smolak et al., 2000) indicate that sport type is a moderating variable for disordered eating behaviors. However, several studies since that time have found that sport type is not a moderating variable (e.g., Sanford-Martens et al., 2005). The present study confirms the finding that sport type is a moderating variable on disordered eating behaviors in athletes; therefore, future research should continue to include sport type as a variable of study.

5. Although the present study indicates that overconformity to the sport ethic may be at play in the perception of and adherence to weight-related coach pressure, future research should explicitly test this link.

6. Findings from the present study indicate that perceived weight-related coach pressure is related to increased disordered eating behaviors and that stronger coach-athlete partnerships may buffer the effect of perceived weight-related coach pressure on disordered eating behaviors. Therefore, if education of the role of the coach on disordered eating behaviors can be incorporated into coach education programs, the effectiveness of such interventions on disordered eating behaviors and other overconforming behaviors should be measured.

APPENDIX A

INFORMED CONSENT

Coach Pressure and Disordered Eating in Female Collegiate Athletes:
Is the Coach-Athlete Relationship a Mediating Variable?

Thank you for taking the time to consider participation in this study. The purpose of this research is to understand the relationship between coach pressure and disordered eating in athletes and the impact of the coach-athlete relationship. We are doing this study so that we can generate more comprehensive knowledge in the field and gain the information necessary to improve current educational programs to prevent disordered eating behaviors in future athletes.

Your participation in this study will require about 20 minutes of your time. I ask only that you complete this questionnaire packet to the best of your ability and return it in the provided manila envelope to the box in the back of this room. Some of the information you are asked to provide may be sensitive in nature; as such, please omit any questions that might make you feel uncomfortable. Additionally, resources will be provided at the end of this session for all participants who would like more information on eating disorder resources.

Participation in this study is 100% voluntary, and will have NO bearing on your position on your squad. You coach/staff will NOT be informed of your results, and will not be present while you complete the questionnaire packet, if you choose to participate. All information obtained through this survey will be kept **CONFIDENTIAL**. We will survey a large number of athletes from multiple universities to further disguise your results and the principal investigator will be the only individual to view the questionnaires. To maintain that confidentiality, please do not write or otherwise indicate your name, SSN, school ID code, or any identifying information anywhere on this questionnaire. We appreciate your honesty in completing this questionnaire as completely and accurately as possible so that we can achieve our goals.

If you have any questions, concerns, or complaints or if you feel you have been harmed by this research please contact Ashley Coker, principal investigator, Department of Exercise and Sport Science, University of Utah at 208.406.6184 or ashley.coker@utah.edu.

Contact the Institutional Review Board (IRB) if you have any questions regarding your rights as a research participant. Also, contact the IRB if you have questions, complaints or concerns which you do not feel you can discuss with the investigator. The University of Utah IRB may be reached by phone at (801) 581-3655 or by e-mail at irb@hsc.utah.edu.

It should take about 20 minutes to complete this questionnaire packet. Again, participation is voluntary. You can choose not to take part and you can also choose not to finish the questionnaire or omit any question you prefer not to answer without penalty or loss of benefits.

By returning this questionnaire, you are giving your consent to participate.

Thank you for your participation.

APPENDIX B

QUESTIONNAIRE PACKET

Thank you for taking the time to consider participation in this study. The purpose of this research is to understand the relationship between coach pressure and disordered eating in athletes and the impact of the coach-athlete relationship. We are doing this study so that we can generate more comprehensive knowledge in the field and gain the information necessary to improve current educational programs to prevent disordered eating behaviors in future athletes.

Your participation in this study will require about 20 minutes of your time. I ask only that you complete this questionnaire packet to the best of your ability and return it in the provided manila envelope to the box in the back of this room. Some of the information you are asked to provide may be sensitive in nature; as such, please omit any questions that might make you feel uncomfortable. Additionally, resources will be provided at the end of this session for all participants who would like more information on eating disorder resources.

Participation in this study is 100% voluntary, and will have NO bearing on your position on your squad. You coach/staff will NOT be informed of your results, and will not be present while you complete the questionnaire packet, if you choose to participate. All information obtained through this survey will be kept ***CONFIDENTIAL****. We will survey a large number of athletes from multiple universities to further disguise your results and the principal investigator will be the only individual to view the questionnaires. To maintain that confidentiality, please do not write or otherwise indicate your name, SSN, school ID code, or any identifying information anywhere on this questionnaire. We appreciate your honesty in completing this questionnaire as completely and accurately as possible so that we can achieve our goals.*

If you have any questions, concerns, or complaints or if you feel you have been harmed by this research please contact Ashley Coker, principal investigator, Department of Exercise and Sport Science, University of Utah at 208.406.6184 or ashley.coker@utah.edu.

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It should take about 20 minutes to complete this questionnaire packet. Again, participation is voluntary. You can choose not to take part and you can also choose not to finish the questionnaire or omit any question you prefer not to answer without penalty or loss of benefits.

By returning this questionnaire, you are giving your consent to participate.

Thank you for your participation.

Background Information:

Please fill in the following information accurately and completely.

Gender: Male_____ Female_____ **Age:** _____

Race: African American_____ Asian_____ Hispanic_____
Native American_____ Caucasian_____ Other_____

Sport(s): _____

Total experience with this sport (over your lifetime):
1-4 yrs _____ 5-7 yrs _____ 7-10 yrs_____
11-13 yrs _____ 14+ yrs _____

Amount of experience on ***this* team:**
Rookie _____ 2nd Year_____
3rd Year _____ 4th Year_____ 5th Year_____

Current Involvement on ***this* team:**
Choose One:
Full Participation _____
Restricted Participation _____
If "Restricted", please specify:
Red/greyshirt _____ Disciplinary Action _____ Injured _____
Other_____

Is this your first year working with the head coach? Yes____ No____

Please describe the coach currently in your life whom you believe is most influential on your daily decisions *(You will answer all questions in this packet that relate to your perceptions of this coach)*
Male_____ Female_____

Age: 20's_____ 30's_____ 40's_____ 50+_____

Head Coach _____ Assistant Coach _____ Strength Coach _____
Other _____

General
Have you *ever* been diagnosed with an eating disorder? Yes____ No____
If yes, which one? Anorexia _____ Bulimia _____ Other _____
Have you *ever* felt pressured by a coach, past or present to lose weight? Yes____ No____
If yes, how so? _____
_____
_____
Have any of your family members been diagnosed with an eating disorder? Yes____ No____
If yes, which one? Anorexia _____ Bulimia _____ Other _____

Have any of your teammates been diagnosed with an eating disorder? Yes____ No____
If yes, which one? Anorexia _____ Bulimia _____ Other _____
Have you ever had a teammate discuss weight control strategies with you?
If so, please describe_____
_____
_____
Would you describe your training primarily for winning?
1 2 3 4 5 6 7
Would you describe your training primarily for improving skills?
1 2 3 4 5 6 7
How often do you exercise outside of your sport's requirements?
Never_____ 1-2 days/week_____ 3-5 days/week_____ 6-7day/week_____

If you exercise outside of your sport's requirements, how long do you exercise for each session?
<1 hour_____ 2-3 hours_____ 4-5 hours_____ 6+ hours_____
About how many calories do you consume a day?
< 1000_____ 1000-1999_____ 2000-2999_____ >3000_____
About how tall are you? _____Ft _____in.
About how much do you weigh? _____Lbs.

Coach-Athlete Relationship Information: ***CART-Q (Jowett & Ntoumanis, 2004)***

Please indicate which number best describes your agreement with the following statements about the coach you identified as most influential in your daily decisions and behaviors.

		1 Strongly Disagree	***2***	***3***	***4 Neutral***	***5***	***6***	***7 Strongly Agree***
A.	I feel close to my coach.	1	2	3	4	5	6	7
B.	I feel committed to my coach.	1	2	3	4	5	6	7
C.	I feel that my sport career is promising with my coach.	1	2	3	4	5	6	7
D.	I like my coach.	1	2	3	4	5	6	7
E.	I trust my coach.	1	2	3	4	5	6	7
F.	I respect my coach.	1	2	3	4	5	6	7

G.	I feel appreciation for the sacrifices my coach has experienced in order to improve my performance.	1	2	3	4	5	6	7
H.	When I am coached by my coach, I feel at ease.	1	2	3	4	5	6	7
I.	When I am coached by my coach, I feel responsive to his/her efforts.	1	2	3	4	5	6	7
J.	When I am coached by my coach, I am ready to do my best.	1	2	3	4	5	6	7
K.	When I am coached by my coach, I adopt a friendly stance.	1	2	3	4	5	6	7

Eating Behavior Information: ***EAT-26***
(Garner et al., 1982)

Please indicate which number best describes your perception of your eating behaviors.

(N=Never, R=Rarely, S=Sometimes, O=Often, U=Usually, A=Always)

A.	I am terrified about being overweight.	N	R	S	O	U	A
B.	I avoid eating when hungry.	N	R	S	O	U	A
C.	I am preoccupied with food.	N	R	S	O	U	A
D.	I have gone on binges, feeling unable to stop.	N	R	S	O	U	A
E.	I cut food into small pieces.	N	R	S	O	U	A
F.	I am aware of the calorie content in foods.	N	R	S	O	U	A
G.	I avoid food with a high in carbohydrates.	N	R	S	O	U	A

H.	I feel others would prefer increased intake.	N	R	S	O	U	A
I.	I vomit after eating.	N	R	S	O	U	A
J.	I feel extremely guilty after eating.	N	R	S	O	U	A
K.	I am preoccupied with desire to be thinner.	N	R	S	O	U	A
L.	I think about burning calories when exercising.	N	R	S	O	U	A
M.	Other people think I am too thin.	N	R	S	O	U	A
N.	I am preoccupied with the thought of having fat on my body	N	R	S	O	U	A
O.	I take longer than others to eat meals.	N	R	S	O	U	A
P.	I avoid meals with sugar in them.	N	R	S	O	U	A
Q.	I eat diet foods.	N	R	S	O	U	A
R.	I feel that food controls my life.	N	R	S	O	U	A
S.	I display self control around food.	N	R	S	O	U	A
T.	I feel that others pressure me to eat.	N	R	S	O	U	A
U.	I give too much time and thought to food.	N	R	S	O	U	A
V.	I feel uncomfortable after eating sweets.	N	R	S	O	U	A
W.	I engage in dieting behavior.	N	R	S	O	U	A
X.	I like my stomach to be empty.	N	R	S	O	U	A
Y.	I have the impulse to vomit after meals.	N	R	S	O	U	A
Z.	I enjoy trying new rich foods.	N	R	S	O	U	A

Pressure in Sport: **WPS-F**

(Greenleaf et. al, in press)

Please circle the number on the 6-point scale listed below that best describes how you truly feel about your current situation and team. There are no right or wrong answers, so please answer honestly.

(1=Always, 2=Usually, 3=Often, 4=Sometimes, 5=Rarely, 6=Never)

1.	My team/sport has a weight requirement to try out	1	2	3	4	5	6
2.	My team/sport should have a weight limit.	1	2	3	4	5	6
3.	Weigh-ins are held periodically throughout the season.	1	2	3	4	5	6
4.	My team performances would improve if I lost at least 5 pounds.	1	2	3	4	5	6
5.	My teammates notice if I put on weight.	1	2	3	4	5	6
6.	My coach encourages female team members to maintain a below average weight.	1	2	3	4	5	6
7.	My team participates in a weight-training program during the season.	1	2	3	4	5	6
8.	The lightest female team members are at a distinct performance advantage.	1	2	3	4	5	6
9.	My team uniform makes me conscious of my bodily appearance.	1	2	3	4	5	6
10.	The crowd scrutinizes my body and makes me concerned about my weight and appearance.	1	2	3	4	5	6
11.	Body weight and appearance are important to my coach.	1	2	3	4	5	6

12.	Body weight and appearance are important to my family.	1	2	3	4	5	6
13.	Body weight and appearance are important to my friends outside of my sport.	1	2	3	4	5	6
14.	Any of my body flaws are readily apparent in my uniform.	1	2	3	4	5	6
15.	Other team members make comments if a teammate gains weight.	1	2	3	4	5	6
16.	My coach notices if I gain weight.	1	2	3	4	5	6
17.	My coach encourages athletes to drop pounds.	1	2	3	4	5	6
18.	The leanest athletes get chosen for the best positions on the team or the best positions in a game/ competition.	1	2	3	4	5	6
19.	There are pressures associated with my sport to lose weight.	1	2	3	4	5	6
20.	There are pressures associated with my sport to maintain a below average weight.	1	2	3	4	5	6
21.	Body weight and appearance are important to me.	1	2	3	4	5	6
22.	My team sets weight goals.	1	2	3	4	5	6

Resources: Courtesy of Students Promoting Eating Disorder Awareness and Knowledge (SPEAK) at the University of Utah
(http://web.utah.edu/speak/SPEAKresources.html)

On Campus Resources

University Student Health Services
Madsen Health Center
555 Foothill Dr., Level 1
Salt Lake City, UT 84112
801-581-6431

University of Utah Nutrition Clinic
1901 E. South Campus Dr. Rm 1078
Salt Lake City, UT 84112
801-581-5417

University of Utah Counseling Center
Student Services Building
201 South 1460 East, Rm 426
801-581-6826

Women's Resource Center
200 S. Central Campus Dr.
Olpin Union, Rm 293
801-581-8030

Off Campus Resources: Treatment Centers

Avalon Hills Residential Treatment Center
Adolescent/Adult Treatment Facility
7852 West 600 North
Petersboro, UT 84325 (near Logan)
800-330-0490
www.avalonhills.org

Center for Change
1760 N. State St.
Orem, UT 84057
888-224-8250
www.centerforchange.com

Remuda Ranch (Adolescents, Adults, Males)
One East Apache Street
Wickenburg, AZ 85390
800-445-1900-
www.remudaranch.com

St. John Therapeutic Services, Inc.
555 East 5300 South
Ogden, UT 84405
801-317-1895
www.stjohntherapy.com

Mental Health Professions: Private Practice

Wendy Hoyt, Ph.D., PC
801-910-5759

Lindy Burton, LCSW
801-581-0422

Carolyn Hollingshead, Ph.D.
801-557-7565

Terry Busch, LCSW
801-487-0630

Mary Hales, Ph.D.
801-541-8412

Steve Varechok, LCSW,
801-277-8100

Heidi Ford, LCSW
801-953-9188

Lynne McCrae, Psy.D.
801-835-1614

Physician Referrals

Amy Cutting, A.P.R.N., M.S.
University Student Health Services
555 Foothill Blvd., Level One
Salt Lake City, UT 84112
801-581-6431

Sonja Van Hala, M.D.
Sugarhouse Family Health Center
1138 E. Wilmington Ave. (2195 South)
Salt Lake City, UT 84106
801-581-2000

Liz Joy, M.D.
Madsen Family Clinic
555 S. Foothill Blvd, Ste. 301
Salt Lake City, UT 84112
801-581-8000

Melissa Briley, PA-C
Madsen Family Clinic
555 S. Foothill Blvd, Ste. 301
Salt Lake City, UT 84112
801-581-8000

Dietician Referrals

Kathie Beals, Ph.D., R.D., FACSM
University of Utah Nutrition Clinic
801-581-5417

Andrea Addley, R.D.
1174 East Graystone #1A
Salt Lake City, UT 84106
801-664-2182

Kim Passmore, RD, CD & Rachael Scott
Center for Change
1790 N. State St.
Orem, Ut 84057
801-224-8250

Kristi Spence, MS, RD, CD
Sports Dietitian
TOSH Sport Science
5848 S. Fashion Blv.
Murray, UT 84107
801-314-4038

Free Support Groups

Center For Change
1760 N. State St.
Orem, UT 84057
888-224-8250
www.centerforchange.com

Bonnie Sheperd
2221 South 1700 East
Salt Lake City, UT
801-231-3442
bbsheperd@comcast.net

Women's Resource Center
Body Politics
200 S. Central Campus Dr.
801-581-8030

Overeating Anonymous
www.oa.org
801-581-8030

Eating Disorder Anonymous
www.eatingdisordersanonymous.org

Note: Despite our best intentions to keep our treatment resources current, referral options change frequently. Visit www.edreferral.com for updates about treatment options in your state or email Dr. Justine Reel directly if you have questions: Justine.Reel@hsc.utah.edu.

Online Resources

Academy for Eating Disorders (AED) www.aedweb.org
American Psychology Association www.apa.org
American Psychiatric Association www.psych.org
Anorexia Nervosa and Related Eating Disorders, Inc. www.anred.com
Body Positive www.bodypositive.com
Caringonline www.caringonline.com
Center for Change www.centerforchange.com
Council on Size and Weight Discrimination www.cswd.org
Eating Disorders Anonymous www.eatingdisordersanonymous.org
Eating Disorder Referral and Information Center www.edreferral.com
Eating Disorder Resources www.bulimia.com
Harvard Eating Disorders Center www.hedc.org
International Association of Eating Disorder Professionals www.iaedp.com
Love Your Body Project, NOW Foundation http www.now.org/foundation/health/whp
Massachusetts Eating Disorder Association (MEDA) www.medainc.org
Media Influence on Body www.about-face.org
National Association of Anorexia Nervosa and Associated Disorders www.anad.org
National Eating Disorders Association www.nationaleatingdisorders.org
Overeaters Anonymous (OA) www.oa.org
The Renfrew Center Foundation www.renfrew.org
Something Fishy www.something-fishy.org

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